SERIAL NO. 3309

# ONKYO® SERVICE MANUAL

## Integrated Stereo Amplifier
## MODEL A-8690

|  |  |
|---|---|
| UG | 220V AC, 50Hz |

SAFETY-RELATED COMPONENT WARNING!!

COMPONENTS IDENTIFIED BY MARK ⚠ ON THE SCHEMATIC DIAGRAM AND IN THE PARTS LIST ARE CRITICAL FOR RISK OF FIRE AND ELECTRIC SHOCK. REPLACE THESE COMPONENTS WITH ONKYO PARTS WHOSE PARTS NUMBERS APPEAR AS SHOWN IN THIS MANUAL.

MAKE LEAKAGE-CURRENT OR RESISTANCE MEASUREMENTS TO DETERMINE THAT EXPOSED PARTS ARE ACCEPTABLY INSULATED FROM THE SUPPLY CIRCUIT BEFORE RETURNING THE APPLIANCE TO THE CUSTOMER.

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ONKYO
AUDIO COMPONENTS

# SPECIFICATIONS

| | | |
|---|---|---|
| Power Output: | 100 watts per channel, min RMS. at 8 ohms, both channels driven from 20 Hz to 20 kHz, with no more than 0.008% Total harmonic distorion. | |
| Dynamic Power: | 310 watts 2 homs, 220 watts 4 ohms | |
| Total Harmonic Distortion: | 0.008% at rated power<br>0.008% at 1 watt output | |
| Intermodulation Distortion: | 0.005% at rated power | |
| Damping Factor: | 100 at 8 ohms | |
| Input Sensitivity/ Impedance: | Phono (MM): | 2.5 mV/50 kohms |
| | Phono (MC): | 160$\mu$V/220 ohms |
| | CD DIRECT: | 150 mV/50 kohms |
| | TUNER: | 150 mV/50 kohms |
| | Tape Play: | 150 mV/50 kohms |
| | VCR Play: | 150 mV/50 kohms |
| | VDP Play: | 150 mV/50 kohms |
| Output Level/Impedance: | Tape Rec: | 150 mV/1.5 kohms (Phono) |
| | Pre Out: | 1 V/600 ohms |
| Phono Overload: | Phono (MM): | 200 mV RMS. at 1 kHz, 0.015% THD. |
| Tone Control: (Vol-20 dB) | CONTRABASS: | +10/+20 dB (Muting: OFF/ON) at 20 Hz |
| | BASS: | ±10 dB at 70 Hz |
| | TREBLE: | ±8 dB at 20 kHz |
| High Cut: | 6 kHz (6 dB/Octave) (TREBLE min.) | |
| Frequency Response: | CD, Tuner: | 2-50,000 Hz (+0, −1 dB) |

| | | |
|---|---|---|
| RIAA Deviation: | Phono (MM): | ±0.3 dB, 20 Hz – 20 kHz |
| Signal to Noise Ratio (IHF-A): | Phono (MM): | 94 dB (5.0 mV input) |
| | Phono (MC): | 75 dB (0.5 mV input) |
| | CD: | 107 dB |
| Muting (Vol – 20 dB): | −15 dB | |

**D/A CONVERTER SECTION**

| | |
|---|---|
| Coaxial Input: | 0.5 Vp–p/75Ω |
| Output: | 0.5 Vp–p/75Ω |
| Optical Input: | |
| Digital Sampling Frequency: | 32,44.1, 48 kHz |
| Frequency Response: | 2–20,000 Hz±0.2 dB |
| Total Harmonic Distortion: | 0.0015% at 1 kHz |
| Signal to Noise Ratio: (IHF-A): | 110 dB |
| Dynamic Range (IHF-A): | 103 dB |
| Max. Output Level: | 2V r.m.s. |

**GENERAL**

| | |
|---|---|
| Power Supply: | European models AC220 V, 50 Hz |
| Dimensions: | 435 (W)×164 (H)×392 (D) mm<br>17-1/8″×6-7/16″×15-7/16″ |
| Weight: | 14.5 kg, 32.0 lbs. |

Specifications and features are subject to change without notice.

# PRECAUTIONS

1. **Replacing the fuses**
   For continued protection against risk fire, replace only with same type and same rating fuse.

| CIRCUIT NO. | PART NO. | DESCRIPTION |
|---|---|---|
| F922 | 252077 or | 4A-SE-EAK Primary fuse |
| | 252077CC | 4A-SE-EAK Primary fuse |

# ADJUSTMENT PROCEDURES

## Adjustments and Checking the Protection Circuitry

### 1. Preparations

1) Place the unit on the workbench. (There should be about 15 mm of space between the base plate of the unit and the work surface.)
2) Set up the unit as follows.
   (1) No load
   (2) No signal
   (3) Volume turned all the way down
   (4) Speaker switch OFF
   (5) Power switch OFF

Note) Check the following points before making adjustments
   (1) The power switch should be OFF.
   (2) The interior of the unit should not be warm.
   (3) The DAC circuit board should be mounted correctly.

### 2. Idling current adjustment

1) Turn the power switch ON and allow the unit to warm up for about 10 minutes.
   (1) Adjust R531 (R532) so that the voltage at test point VCT-IID on the NAAF-3114 circuit board is 15mV±5mV.

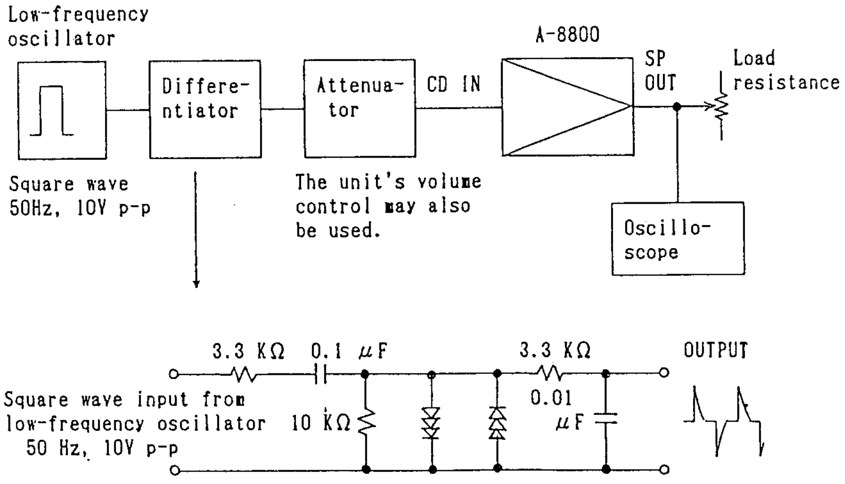
### 3. Check of operation of protection circuitry

1) Check of operation of protection relay
   (1) Confirm that the relay turns ON approximately 5 seconds after the power switch is turned ON.
   (2) The SOURCE DIRECT indicator LED should light at the same time.
   (3) The relay should turn OFF approximately 0.5 seconds after the power switch is turned OFF.
2) Check of DC detection and servo circuitry operation
   (1) Turn the power on with no load.
   (2) After the speaker relay turns ON, apply DC+200mV to the LINE input terminals. Confirm that the relay turns OFF.
   (3) Confirm that operation is the same as (2) above when an input of DC−200mV is applied.

Note) Under no circumstances connect a load or short the speaker terminals when performing the above test.

3) Signal input from the circuit illustrated below with no load.
   (1) Confirm that the speaker relay does not turn OFF even when a 2 ohm load is connected when a peak value of 35V p-p is output.
   (2) Next, confirm that when a 1 ohm load is connected the speaker relay switches OFF and ON a couple of times and then stays OFF.

Note) The period before that relay stays OFF should not last for more than 1 minute.
Relay OFF status can be canceled by switching the power OFF.


Low-frequency oscillator
Differentiator
Attenuator
CD IN
A-8800
SP OUT
Load resistance
Square wave 50Hz, 10V p-p
The unit's volume control may also be used.
Oscilloscope
3.3 KΩ
0.1 μF
3.3 KΩ
OUTPUT
Square wave input from low-frequency oscillator 50 Hz, 10V p-p
10 KΩ
0.01 μF

NOTE) Semi-fixed resistors enclosed in parentheses ( ) are for the right channel.

## 4. DAC block adjustment

1) Confirmation of fs display

(1) Input a digital signal to one of the DIGITAL input terminals (1–3).

(2) The indicator LED should light as follows according to the sampling frequency of the input signal.

| | |
|---|---|
| 32kHz | orange |
| 44.1kHz | green |
| 48kHz | red |

2) Distortion adjustment

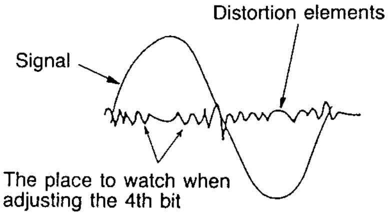
(1) Preparations

- Connect the digital output terminal of a suitable equipped CD player to the DIGITAL 1 digital input terminal of the A-8690.
- Connect a distortion meter to the analog output of circuit board NADC-3386 or to the unit's analog REC OUT terminal.
- Input the distortion meter signal output and the distortion output to dual-phenomenon oscilloscope.

(2) Turn power ON to the unit.

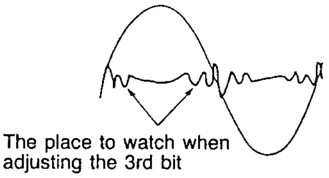
(3) Play track 2 of the test disc (YEDS-18).

(4) Adjusting the 4th bit.
Adjust semi-fixed resistor R815 (R816) so that the non-continuous portion (difference in level) of the distortion elements shown at right is as small as possible.


Distortion elements
Signal
The place to watch when adjusting the 4th bit

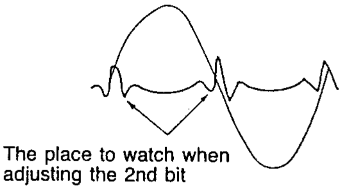
Representative un-adjusted waveform

(5) Adjusting the 3rd bit.
As with (3) above, adjust semi-fixed resistor R813 (R-814) so that the non-continuous portion (difference in level) of the distortion elements is as small as possible.

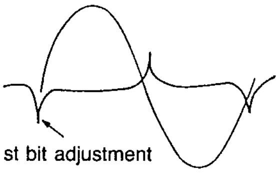

The place to watch when adjusting the 3rd bit

(6) Adjusting the 2nd bit.
As above, adjust semi-fixed resistor R811 (R 812) so that the non-continuous portion (difference in level) of the distortion elements is as small as possible.

Note) It does not matter is up to this point the level of overall distortion is high.

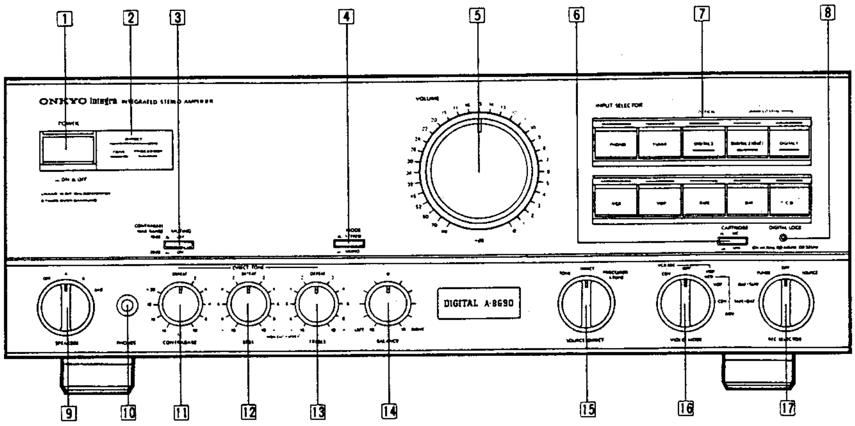

The place to watch when adjusting the 2nd bit

(7) Adjusting the 2nd bit.
Adjust semi-fixed resistor R809 (R 810) so that the non-continuous portion of the final remaining distortion waveform is as small as possible.



(8) Repeat steps (4) – (7) above to fine adjust to optimum settings.
Note) The distortion meter must be accurate to 0.001% or better and possess a distortion output terminal.

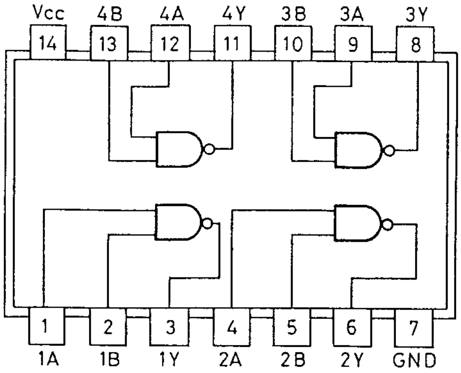
## FRONT PANEL FACILITIES



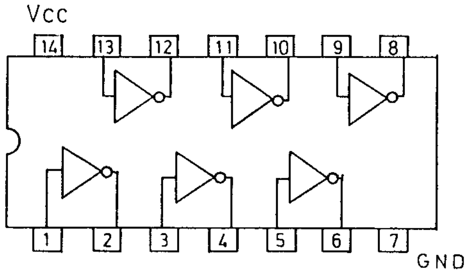
1. Power switch (POWER)
2. Operation indicator (DIRECT/TONE/PROCESSOR)
3. Muting switch (MUTING)
4. Mode selector switch (MODE)
   STEREO, MONO
5. Volume control (VOLUME)
6. Cartridge selector switch (CARTRIDGE)
   MC, MM
7. Input selector buttons and Indicators (INPUT SELECTOR)
   DIGITAL 1, DIGITAL 2 (DAT), DIGITAL 3
   PHONO, TUNER, VCR, VDP, TAPE, DAT, CD
8. Digital lock indicator (DIGITAL LOCK)
9. Speaker selector switch (SPEAKERS)
   OFF, A, B, A+B
10. Headphone jack (PHONES)
11. Contrabass control (CONTRABASS)
12. Bass control (BASS)
13. Treble control (TREBLE)
14. Balance control (BALANCE)
15. Source direct switch (SOURCE DIRECT)
    TONE, DIRECT, PROCESSOR & TONE
16. Video mode switch (VIDEO MODE)
    VCR REC···CDV, OFF, VDP/VCR
    VDP/VCR, VDP, CDV···BGV
17. Recording source selector switch (REC SELECTOR)
    TAPE ▶ DAT, DAT ▶ TAPE, TUNER, OFF, SOURCE

# IC BLOCK DIAGRAM

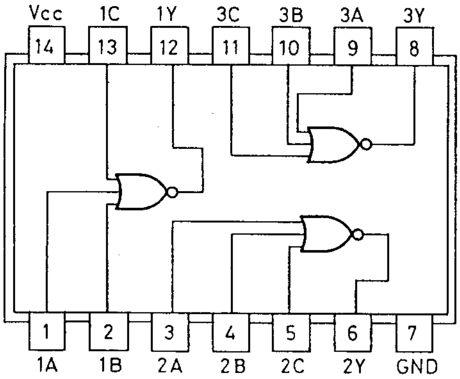
## 74HC00P (NAND gate)


Vcc
4B
4A
4Y
3B
3A
3Y
14
13
12
11
10
9
8
1
2
3
4
5
6
7
1A
1B
1Y
2A
2B
2Y
GND

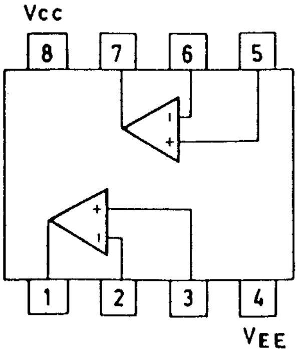
## 74HCU04P (Hex inverter)


Vcc
14
13
12
11
10
9
8
1
2
3
4
5
6
7
GND

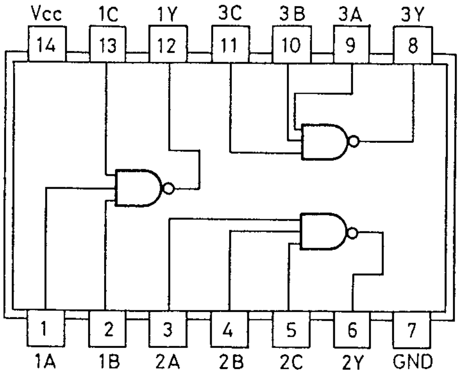
## 74HC27P (NOR gate)


Vcc
1C
1Y
3C
3B
3A
3Y
14
13
12
11
10
9
8
1
2
3
4
5
6
7
1A
1B
2A
2B
2C
2Y
GND

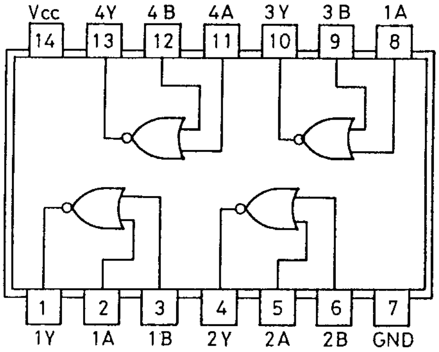
## NJM4560DX (OP Amp.)
## NJM4565DB
## NJM2904D
## NJM5532DD


Vcc
8
7
6
5
1
2
3
4
VEE

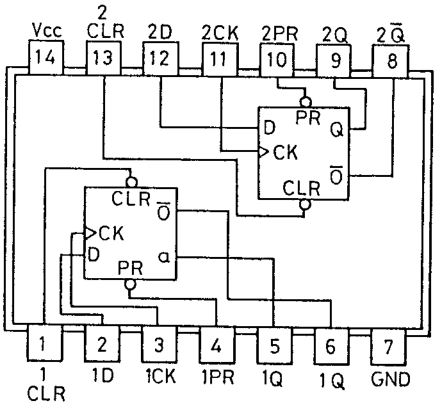
## 74HCU10P (NAND gate)


Vcc
1C
1Y
3C
3B
3A
3Y
14
13
12
11
10
9
8
1
2
3
4
5
6
7
1A
1B
2A
2B
2C
2Y
GND

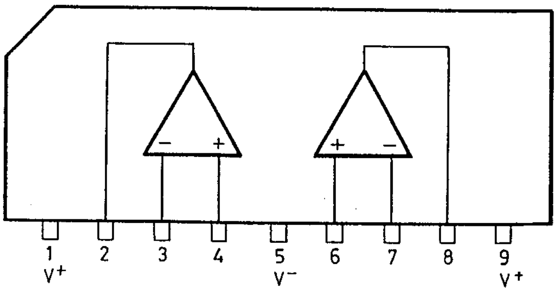
## 74HC02P (NOR gate)


Vcc
4Y
4B
4A
3Y
3B
1A
14
13
12
11
10
9
8
1
2
3
4
5
6
7
1Y
1A
1B
2Y
2A
2B
GND

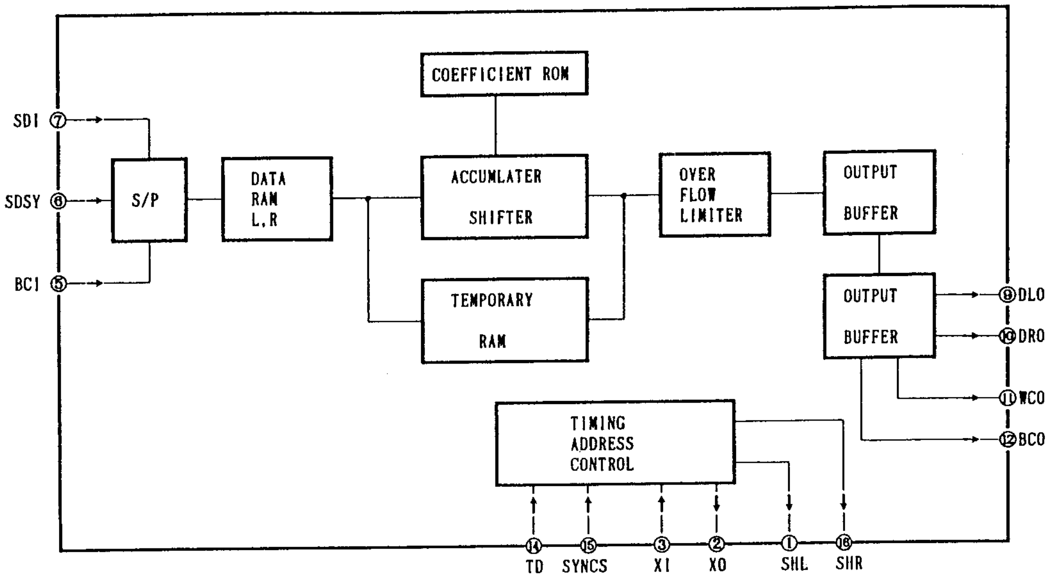
## 74HC74P (D-FF)


Vcc
2 CLR
2D
2CK
2PR
2Q
2Q̄
14
13
12
11
10
9
8
D
PR
Q
CK
CLR
Q̄
CLR
Q̄
CK
D
PR
Q
1
2
3
4
5
6
7
1 CLR
1D
1CK
1PR
1Q
1Q̄
GND

## NJM4558SE (OP Amp.)

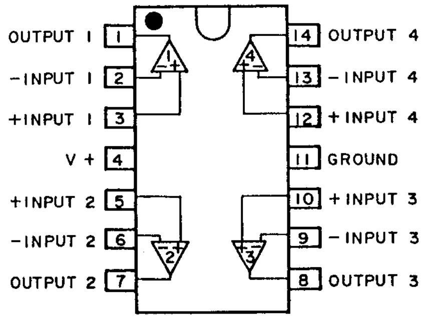

−
+
+
−
1
V+
2
3
4
5
V−
6
7
8
9
V+

## YM3414 (Eight times over sampling digital filter)

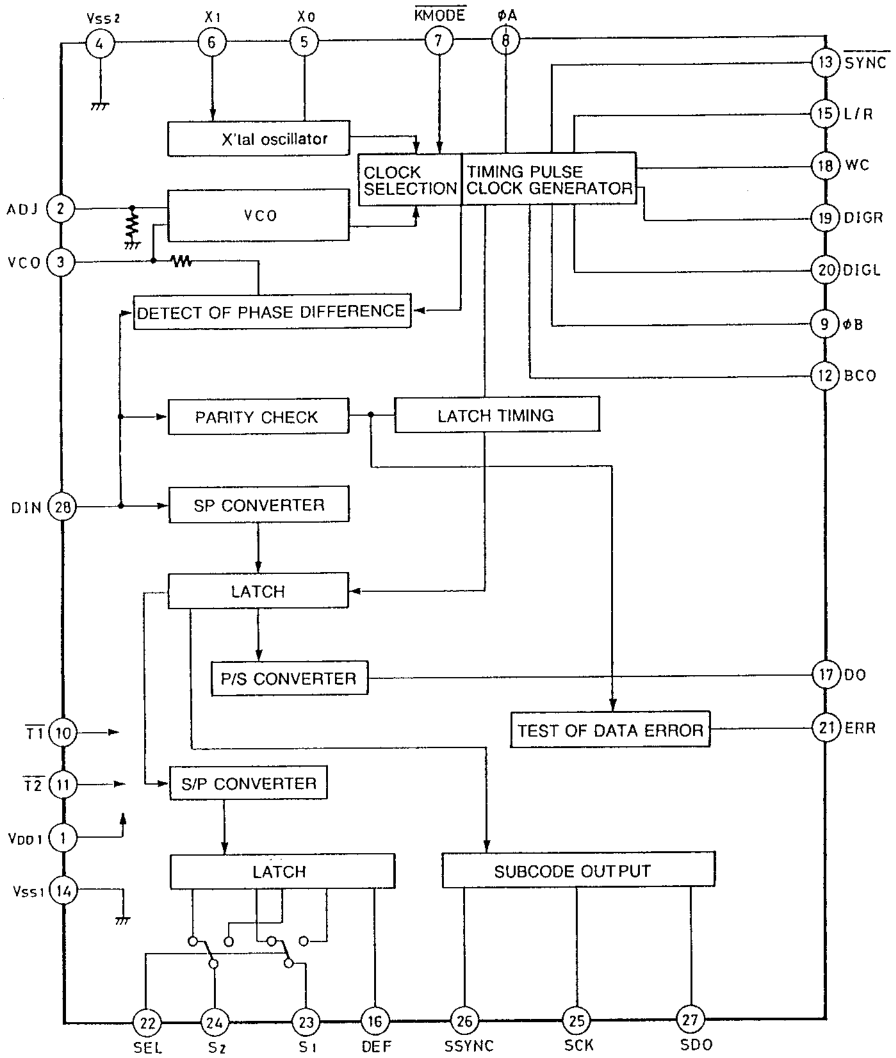

SDI ⑦
SDSY ⑥
BCI ⑤
S/P
DATA RAM L,R
COEFFICIENT ROM
ACCUMLATER SHIFTER
TEMPORARY RAM
OVER FLOW LIMITER
OUTPUT BUFFER
OUTPUT BUFFER
⑨DLO
⑩DRO
⑪WCO
⑫BCO
TIMING ADDRESS CONTROL
⑭ TD
⑮ SYNCS
③ XI
② XO
① SHL
⑯ SHR

| PIN NO. | TERMINAL | I/O | DESCRIPTION |
|---|---|---|---|
| 1 | SHL | O | When one DAC(TD=L):Deglitching signal of left channel (when four times) When two DAC(TD=H):Deglitching signal of left and right channels(when eight times) |
| 2<br>3 | XO<br>XI | O<br>I | Connect the x'tal oscillator between XI and XO.<br>The clock frequency is 384×Fs. |
| 4 | VDD2 | | +5V:Power supply terminal for x'tal oscillator and deglitching signal. |
| 5<br>6<br>7 | BCI<br>SDSY<br>SDI | I<br>I<br>I | Bit clock input terminal.<br>Clock shown L/Rch division of input data and input timing.<br>16 bits serial data input terminal. |
| 8 | VDDI | | +5V:Power supply terminal for digital signal. |
| 9 | DLO | O | When one DAC(TD=L):Output terminal for L/R channel data (When four times) When two DAC(TD=H):Output terminal for L channel data (when eight times) |
| 10<br>11<br>12 | DRO<br>WCO<br>BCO | O<br>O<br>O | R channel data output terminal.<br>Word clock of output data DLO/DRO.<br>Bit clock of output data. |
| 13 | VSS | | Ground terminal |
| 14 | TD | I | 1DAC/2DAC selector terminal: 1DAC at low. 2DAC at high. |
| 15 | SYNCS | I | Asynchronous input jitter absorption synchronous signal. Synchronous input at high level. SDSY inhibiting at low level. |
| 16 | SHR | O | R channel deglitching signal when one DAC. |

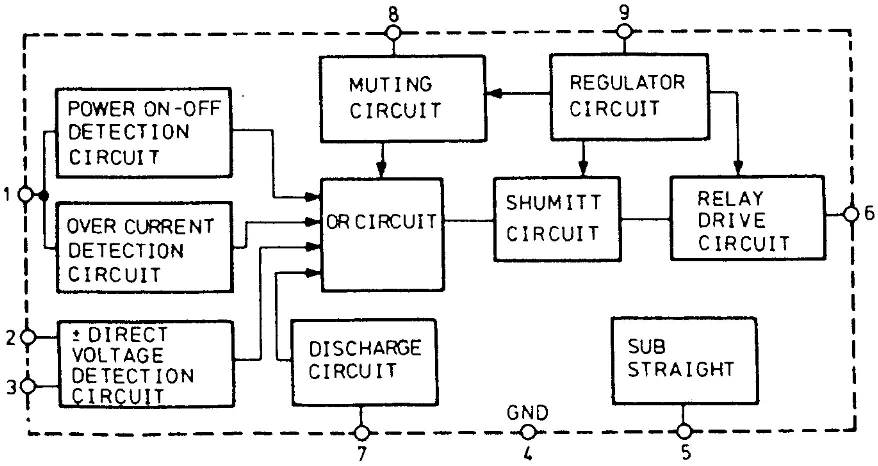
## NJM2902N (OP Amp)


OUTPUT 1 1
−INPUT 1 2
+INPUT 1 3
V + 4
+INPUT 2 5
−INPUT 2 6
OUTPUT 2 7
14 OUTPUT 4
13 −INPUT 4
12 +INPUT 4
11 GROUND
10 +INPUT 3
9 −INPUT 3
8 OUTPUT 3
1
2
3
4

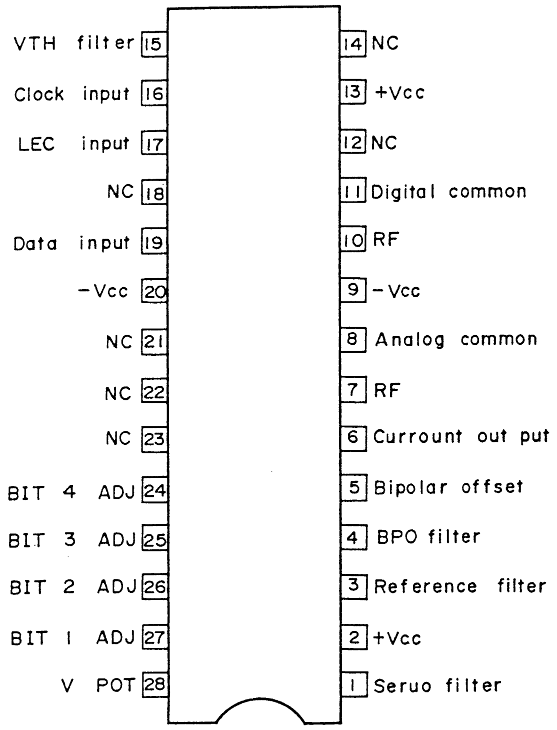
## YM3623B (Digital decoder)


Vss2
X1
X0
KMODE
φA
4
6
5
7
8
13 SYNC
15 L/R
18 WC
19 DIGR
20 DIGL
9 φB
12 BCO
17 DO
21 ERR
X'tal oscillator
CLOCK SELECTION
TIMING PULSE CLOCK GENERATOR
ADJ 2
VCO 3
VCO
DETECT OF PHASE DIFFERENCE
PARITY CHECK
LATCH TIMING
DIN 28
SP CONVERTER
LATCH
P/S CONVERTER
TEST OF DATA ERROR
T1 10
T2 11
VDD1 1
Vss1 14
S/P CONVERTER
LATCH
SUBCODE OUTPUT
22 SEL
24 S2
23 S1
16 DEF
26 SSYNC
25 SCK
27 SDO

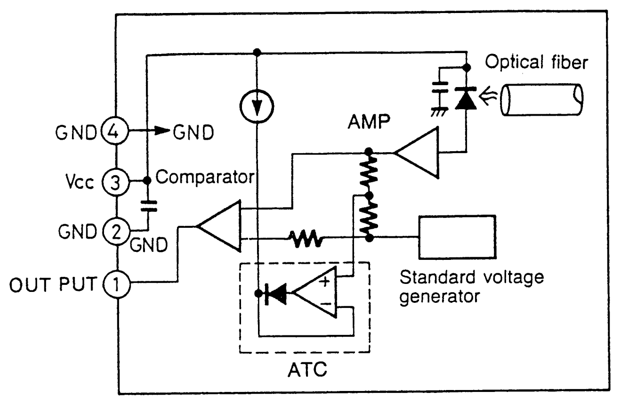
## TA7317P (Protective circuit)


8
9
MUTING CIRCUIT
REGULATOR CIRCUIT
POWER ON-OFF DETECTION CIRCUIT
1
OVER CURRENT DETECTION CIRCUIT
OR CIRCUIT
SHUMITT CIRCUIT
RELAY DRIVE CIRCUIT
6
2
3
± DIRECT VOLTAGE DETECTION CIRCUIT
DISCHARGE CIRCUIT
SUB STRAIGHT
GND
7
4
5

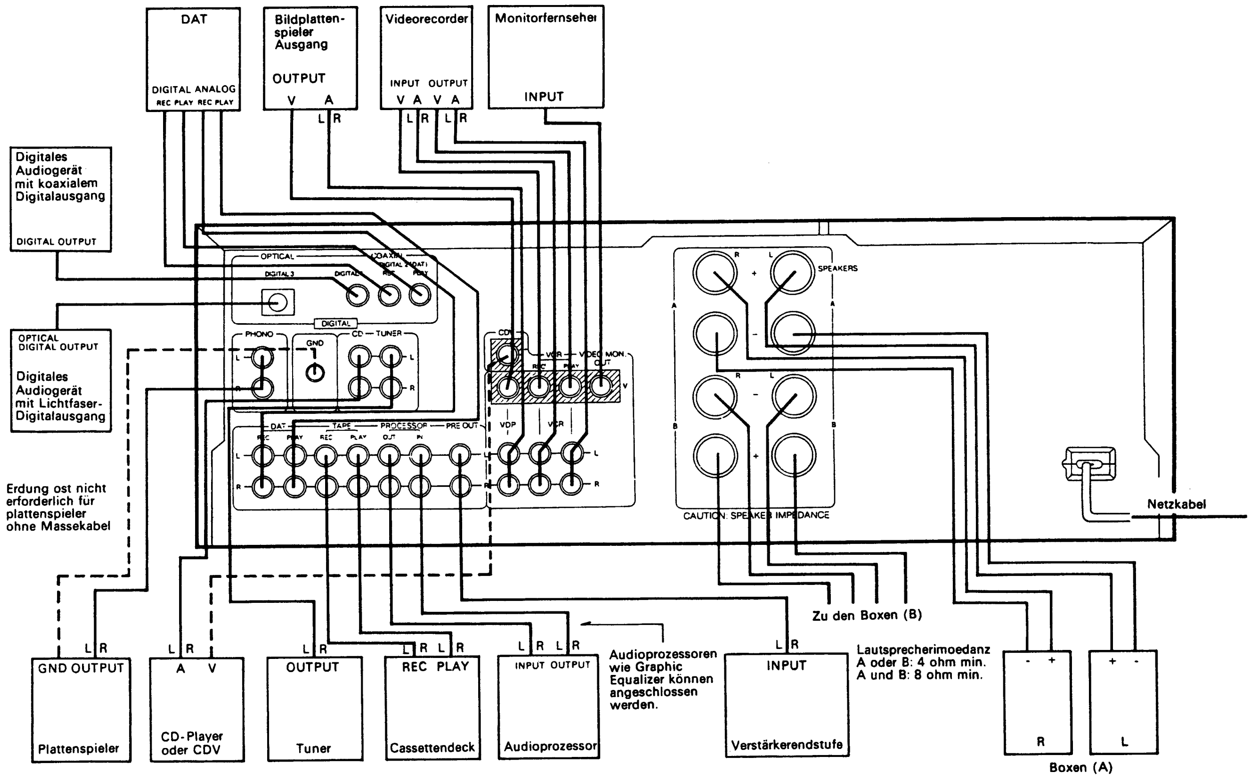
## PCM58P (D/A converter)


VTH filter 15
Clock input 16
LEC input 17
NC 18
Data input 19
−Vcc 20
NC 21
NC 22
NC 23
BIT 4 ADJ 24
BIT 3 ADJ 25
BIT 2 ADJ 26
BIT I ADJ 27
V POT 28
14 NC
13 +Vcc
12 NC
11 Digital common
10 RF
9 −Vcc
8 Analog common
7 RF
6 Curroount out put
5 Bipolar offset
4 BPO filter
3 Reference filter
2 +Vcc
1 Seruo filter

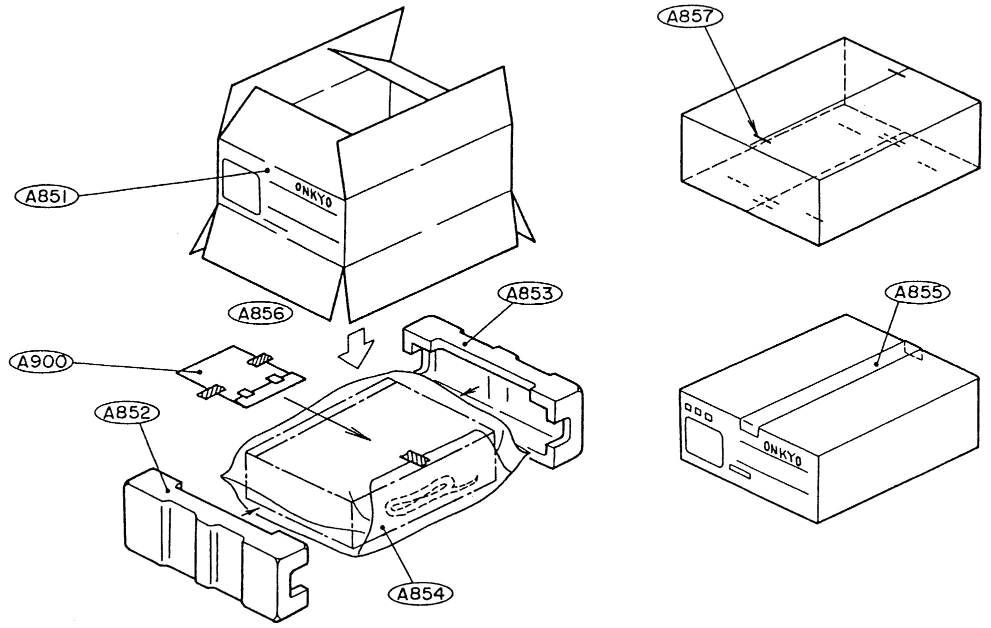
## TORX175 (Optical receiver)


Optical fiber
AMP
GND 4
GND
Vcc 3
Comparator
GND 2
GND
OUT PUT 1
Standard voltage generator
ATC

## SYSTEM CONNECTIONS

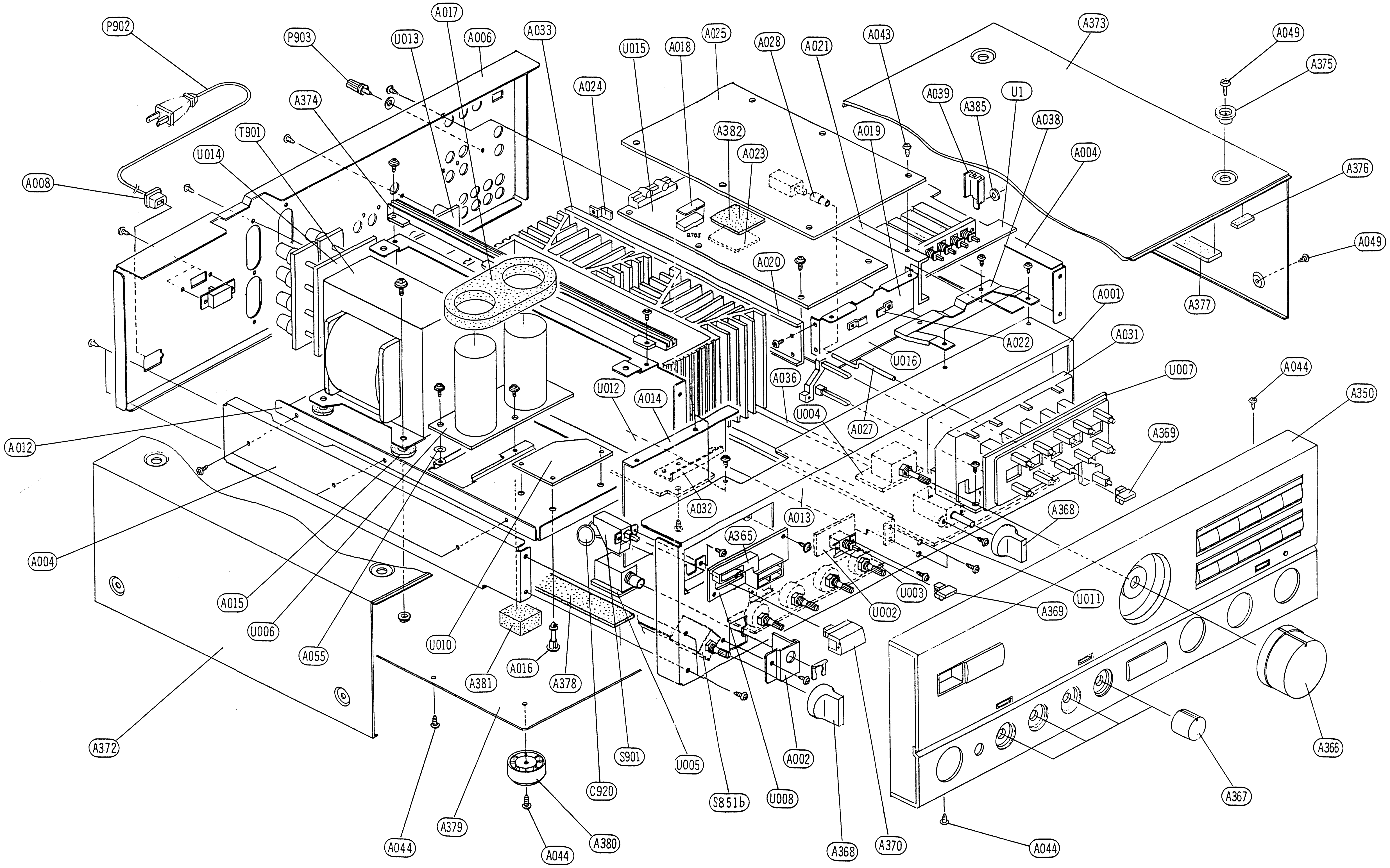

DAT
DIGITAL ANALOG
REC PLAY REC PLAY
Bildplatten-spieler Ausgang
OUTPUT
V A
L R
Videorecorder
INPUT OUTPUT
V A V A
L R L R
Monitorfernseher
INPUT
Digitales Audiogerät mit koaxialem Digitalausgang
DIGITAL OUTPUT
OPTICAL DIGITAL OUTPUT
Digitales Audiogerät mit Lichtfaser-Digitalausgang
OPTICAL
COAXIAL
DIGITAL 3
DIGITAL
PHONO
GND
CD — TUNER
CD
VCR
VIDEO MON. OUT
DAT
TAPE
PROCESSOR
PRE OUT
REC
PLAY
OUT
IN
VDP
VCR
SPEAKERS
CAUTION: SPEAKER IMPEDANCE
Erdung ost nicht erforderlich für plattenspieler ohne Massekabel
Netzkabel
GND OUTPUT
Plattenspieler
A V
CD-Player oder CDV
OUTPUT
Tuner
REC PLAY
Cassettendeck
INPUT OUTPUT
Audioprozessor
Audioprozessoren wie Graphic Equalizer können angeschlossen werden.
INPUT
Verstärkerendstufe
Zu den Boxen (B)
Lautsprecherimoedanz
A oder B: 4 ohm min.
A und B: 8 ohm min.
R
L
Boxen (A)

## PACKING PROCEDURES


A857
A851
A856
A853
A855
A900
A852
A854
ONKYO
ONKYO

| REF. NO. | PART NO. | DESCRIPTION |
|---|---|---|
| A851 | 29051789 | MASTER CARTON BOX |
| A852 | 29091202 | PAD, LEFT |
| A853 | 29091203 | PAD, RIGHT |
| A854 | 29095108-1 | SHEET, 1000×600 |
| A855 | 260012 | DAMPLON TAPE, W50 |
| A856 | 261504 | PAPER TAPE |
| A857 | 282301 | SEALING HOOK |
| A900 | — | ACCESSARY BAG |
|  | 29341327 | INSTRUCTION MANUAL |
|  | 29365020 | WARRANTY CARD |
|  | 29100094A | POLY BAG (WARRANTY CARD) |
|  | 29100006A | POLY BAG 350×250 |

# CHASSIS-EXPLODED VIEW


P902
P903
U013
A017
A006
A033
U015
A018
A025
A028
A021
A043
A373
A049
A375
A374
T901
U014
A008
A024
A382
A023
A039
A385
U1
A038
A019
A004
A376
A020
A049
A001
A377
A022
U016
A031
A036
U012
A014
U004
A027
U007
A044
A350
A012
A369
A032
A013
A368
A365
A004
U011
U003
A369
A015
U002
U006
A055
U010
A016
A381
A378
A366
A372
S901
U005
A002
C920
S851b
U008
A367
A379
A380
A044
A044
A368
A370
A044

# CHASSIS-EXPLODED VIEW-PARTS LIST

| REF. NO. | PART NO. | DESCRIPTION |
|---|---|---|
| A001 | 27110382 | FRONT BRACKET |
| A002 | 27141199 | BRACKET (HP) |
| A004 | 27115230C | SIDE BRACKET |
| A006 | 27121176A | BACK PANEL |
| A008 | 27300750 | BUSHING (CORD) |
| A012 | 27130548B | BRACKET (PT) |
| A013 | 27130502C | BRACKET (H) |
| A014 | 27150259 | SHIELD PLATE |
| A015 | 27270213 | SPACER (PT) |
| A016 | 27190657 | HOLDER |
| A017 | 28140882 | CUSHION (DUMPTER) |
| A018 | 28400454 | STABILIZER (DAC) |
| A019 | 27130549A | BRACKET (D) |
| A020 | 27225087C | SHIELD CASE (DL) |
| A021 | 27225088C | SHIELD CASE (DR) |
| A022 | 27141282 | BRACKET (O) |
| A023 | 28140808 | CUSHION |
| A024 | 27141229A | BRACKET (O) |
| A025 | 27262485 | PLATE (D) |
| A027 | 27260237C | SHAFT |
| A028 | 28320135 | JOINT |
| A031 | 27273086E | JOINT ASS'Y |
| A032 | 27141161A | BRACKET (HF) |
| A033 | 27160230 | HEATSINK |
| A035 | 27141162A | BRACKET (HB) |
| A036 | 27130503D | BRACKET (PC) |
| A038 | 27141163A | BRACKET (D) |
| A039 | 27141235 | BRACKET (E) |
| A043 | 82143006 | PAN HEAD SCREW, 3P+6FNBC |
| A044 | 834430088 | TAP-TIGHT SCREW, 3TTS+8BBC |
| A049 | 838440089 | TAP-TIGHT SCREW, 4TTB+8CBC |
| A053 | 87313006 | TOOTHED WASHER, M-3B |
| A055 | 27270273 | SPACER |
| A350 | 1A116121 | FRONT PANEL |
| A365 | 28199174 | FILM |
| A366 | 28323171 | KNOB (VOL) |
| A367 | 28323123 | KNOB (TONE) |
| A368 | 28323173 | KNOB (SP) |
| A369 | 28323174 | KNOB (PUSH) |
| A370 | 28323175 | KNOB (POW) |
| A371 | 28323176 | KNOB (CAP) |
| A372 | 28184409 | TOP COVER (L) |
| A373 | 28184410 | TOP COVER (R) |
| A374 | 27273090 | JOINT (COVER) |
| A375 | 27265155A | WASHER (COVER) |
| A376 | 28140020 | CUSHION |
| A377 | 28140695 | CUSHION |
| A378 | 28140761 | CUSHION |
| A379 | 27170251A | BOTTOM BOARD |
| A380 | 27175153 | LEG ASS'Y |
| A381 | 28140810 | CUSHION |
| A382 | 28140807 | CUSHION |
| A385 | 27175011C | LEG |
| Q609, Q610 | 2201873 or | TRANSISTOR, 2SC3858-O or |
| | 2201876 or | TRANSISTOR, 2SC3858-P or |
| | 2201874 | TRANSISTOR, 2SC3858-Y |
| Q611, Q612 | 2201863 or | TRANSISTOR, 2SA1494-O or |
| | 2201866 or | TRANSISTOR, 2SA1494-P or |
| | 2201864 | TRANSISTOR, 2SA1494-Y |
| ⚠ T901 | 2300365B | POWER TRANSFORMER, NPT-1008G |
| ⚠ C920 | 350065A | 0.01 μF, AC400V/125V, CAPACITOR (IS) |
| ⚠ C920a | 27300601 | COVER (CAPACITOR), SB-1925 |
| ⚠ P902 | 25148 or | POWR SUPPLY CABLE, AS-CEE or |
| | 253150 | POWR SUPPLY CABLE, AS-CEE |
| P903 | 25060044 | GROUND TERMINAL |
| ⚠ F922 | 252077 or | 4A-SE-EAK or |
| | 252077CC | 4A-SE-EAK |
| ⚠ S901 | 25035345A | POWRE SWITCH, NPS-111-L308P |
| S851b | 25030294 | REMOTE SWITCH, OPERATION SECTION |
| U001 | 1A116505-3A | NASW-3105-3A, INPUT SWITCH & EQUALIZER CIRCUIT PC BOARD ASS'Y |
| U002 | 1A115506-3 | NASW-3106-3, MODE SWITCH CIRCUIT PC BOARD ASS'Y |
| U003 | 1A115507-3 | NAAF-3107-3, TONE CONTROL CIRCUIT PC BOARD ASS'Y |
| U004 | 1A115508-3 | NAAF-3108-3, VOLUME CONTROL CIRCUIT PC BOARD ASS'Y |
| U005 | 1A115509-3 | NAETC-3109-3, HEAD PHONE JACK PC BOARD ASS'Y |
| U006 | 1A115510-3 | NAPS-3110-3, POWER SUPPLY CIRCUIT PC BOARD ASS'Y |
| U007 | 1A115511-3 | NADIS-3111-3, INPUT LED CIRCUIT PC BOARD ASS'Y |
| U008 | 1A115512-3 | NADIS-3112-3, DISPLAY LED CIRCUIT PC BOARD ASS'Y |
| U009 | 1A115521-3 | NASW-3121-3, MUTING SWITCH CIRCUIT PC BOARD ASS'Y |
| U010 | 1A115585-3A | NAETC-3385-3A, FUSE CIRCUIT PC BOARD ASS'Y |
| U011 | 1A116513-3A | NAAF-3113-3A, POWER AMPLIFIER (I) PC BOARD ASS'Y |
| U012 | 1A115514-3 | NAAF-3114-3, POWER AMPLIFIER (II) PC BOARD ASS'Y |
| U013 | 1A115516-3 | NAETC-3116-3, VIDEO TERMINAL PC BOARD ASS'Y |
| U014 | 1A116517-3A | NAETC-3117-3A, SPEAKER & PROTECTOR CIRCUIT PC BOARD ASS'Y |
| U015 | 1A115586-1 | NADG-3386-1, DIGITAL CIRCUIT PC BOARD ASS'Y |
| U016 | 1A115587-1 | NAPS-3387-1, DIGITAL POWER SUPPLY CIRCUIT PC BOARD ASS'Y |

NOTE: THE COMPONENTS IDENTIFIED BY MARK ⚠ ARE CRITICAL FOR RISK OF FIRE AND ELECTRIC SHOCK. REPLACE ONLY WITH PARTS NUMBER SPECIFIED.

# PRINTED CIRCUIT BOARD PARTS LIST

## INPUT SWITCH & EQUALIZER CIRCUIT PC BOARD (NASW-3105-3A) – PARTS LIST

| CIRCUIT NO. | PART NO. | DESCRIPTION |
|---|---|---|
| | **IC** | |
| Q105 | 222570 | NJM4560X |
| | **Transistors** | |
| Q101~104 | 2212185 or<br>2212186 | 2SK170GR or<br>2SK170BL |
| | **Coils** | |
| L101, L102 | 231133 | NCH-1188 |
| | **Capacitors** | |
| C101, C102 | 372125604 | 56 pF, 50V, Styrene |
| C103, C104 | 372121014 | 100 pF, 50V, Styrene |
| C105, C106 | 372122214 | 220 pF, 50V, Styrene |
| C107, C108 | 372121014 | 100 pF, 50V, Styrene |
| C109, C110 | 373302224 | 2200 pF, 12V, Film (PP) |
| C111, C112 | 379122234 | 0.022 μF, 50V, Film (DEW) |
| C113, C114 | 379121834 | 0.018 μF, 50V, Film (DEW) |
| C115, C116 | 379124734 | 0.047 μF, 50V, Film (DEW) |
| C117, C124 | 354741029 | 1000 μF, 16V, Elect. |
| C118, C123 | 391221227 | 1200 μF, 6.3V, Elect. (MUSE) |
| C119, C120 | 391280227 | 2.2 μF, 50V, Elect. (MUSE) |
| C121, C122 | 379121225 | 1200 pF, 50V. Film (DEW) |
| C125, C126 | 372121024 | 1000 pF, 50V, Styrene |
| C127 | 379121025 | 1000 pF, 50V, Film (DEW) |
| C131, C132 | 354754719 | 470 μF, 25V, Elect. |
| C203, C204 | 373301014 | 100 pF, 125V, Film (PP) |
| | **Switches** | |
| S101 | 25035583 | NPS-142-L545 |
| S201 | 25035572 | NPS-742-362-L534 |
| | **Sockets** | |
| P101 | 2000764 | NSAS-6P720 |
| P223 | 2000557 | NSAS-6P513 |
| P224 | 2000960 | NSAS-8P912 |
| P232 | 2000776 | NSAS-10P732 |
| P961 | 2000665 | NSAS-8P621 |
| P962 | 2000782 | NSAS-14P782 |
| | **Jumper socket** | |
| JL102 | 25050267 | NSCT-3P95 |
| JL255 | 25050272 | NSCT-8P100 |
| JL256 | 25050270 | NSCT-6P98 |
| JL227 | 25050271 | NSCT-7P99 |
| JL229 | 25050272 | NSCT-8P100 |
| JL231 | 25050270 | NSCT-6P98 |
| | **Terminals** | |
| P191, P202 | 25045182 | NPJ-2PDBL72 (PH) |
| P201 | 25045233 | NPJ-2PDBL107 (CD) |
| | **Plug** | |
| P211a | 25055133 | NPLG-3P117 |

## MODE SWITCH CIRCUIT PC BOARD (NASW-3106-3) – PARTS LIST

| CIRCUIT NO. | PART NO. | DESCRIPTION |
|---|---|---|
| | **Switch** | |
| S332 | 25035584 | NPS-122-L546 |

## TONE CONTROL CIRCUIT PC BOARD (NAAF-3107-3) – PARTS LIST

| CIRCUIT NO. | PART NO. | DESCRIPTION |
|---|---|---|
| | **Capacitors** | |
| C301, C302 | 379128225 | 8200 pF, 50V, Film (DEW) |
| C303, C304 | 379125625 | 5600 pF, 50V, Film (DEW) |
| C305, C306 | 379121025 | 1000 pF, 50V, Film (DEW) |
| C307, C308 | 379123935 | 0.039 μF, 50V, Film (DEW) |
| C309, C310 | 379128235 | 0.082 μF, 50V, Film (DEW) |
| | **Resistors** | |
| R301 | 5148107 | N16RGMC250KMN25, Variable |
| R302 | 5148108 | N16RGM11C219K25, Variable |
| R303 | 5144001 | N16RQM11C139K176K25, Variable |
| R304 | 5148113A | N16RGM11C176K25, Variable |

## VOLUME CONTROL CIRCUIT PC BOARD (NAAF-3108-3) – PARTS LIST

| CIRCUIT NO. | PART NO. | DESCRIPTION |
|---|---|---|
| | **Resistor** | |
| R305 | 5104212 | N27DQ100KT100KT25 Variable |
| | **Plug** | |
| P361a | 25055137 | NPLG-7P121 |
| | **Jumper socket** | |
| JL361 | 25050272 | NSCT-8P100 |

## HEAD PHONE JACK PC BOARD (NAETC-3109-3) – PARTS LIST

| CIRCUIT NO. | PART NO. | DESCRIPTION |
|---|---|---|
| | **Stereo jack** | |
| P853 | 25045229 | HLJ4317-01-3120 |

## POWER SUPPLY CIRCUIT PC BOARD (NAPS-3110-3) – PARTS LIST

| CIRCUIT NO. | PART NO. | DESCRIPTION |
|---|---|---|
| | **Diodes** | |
| D921 | 22380014 | PB102F |
| D922, D923 | 22380003 | 1N5402F |
| | **Capacitors** | |
| C921, C922 | 3500101A | 15000μF, 71V, Elect |
| C923, C925 | 375103345 | 0.33 μF, 125V, Elect. (ME) |
| C924 | 375104745 | 0.47 μF, 125V, Elect. (ME) |
| | **Resistors** | |
| R921, R922 | 442522294 | 0.22Ω, 1/2W, Metal oxide film |
| R923 | 442525104 | 51Ω, 1/2W, Metal oxide film |
| | **Plate** | |
| | 27301035 | Bus line |

## INPUT LED CIRCUIT PC BOARD (NADIS-3111-3) – PARTS LIST

| CIRCUIT NO. | PART NO. | DESCRIPTION |
|---|---|---|
| | **Diodes** | |
| D201~D203 | 225142CX1 or<br>225142CX2 or<br>225142DX1 or | SEL2913K-CX1 or<br>SEL2913K-CX2 or<br>SEL2913K-DX1 or |

| | | |
|---|---|---|
| | 225142DX2 | SEL2913K-DX2, LED |
| D204~D210 | 225137DG or | SEL2413E-DG or |
| | 225137DY or | SEL2413E-DY or |
| | 225137CG or | SEL2413E-CG or |
| | 225137CY | SEL2413E-CY, LED |
| D211 | 225248 | GL5ED5, LED |
| | **Sockets** | |
| P951 | 2000918 | NSAS-6P871 |
| | **Plugs** | |
| P961 | 25055185 | NPLG-4P169 |
| P962 | 25055188 | NPLG-7P172 |
| | **Holder** | |
| | 27190573A | (LED-11) |

## DISPLAY LED CIRCUIT PC BOARD (NADIS-3112-3) – PARTS LIST

| CIRCUIT NO. | PART NO. | DESCRIPTION |
|---|---|---|
| | **Diodes** | |
| D911 | 225142DX2 | SEL2913K-DX2 |
| D912 | 225142DX2 | SEL2913K-DX2 |
| D301~D304 | 225137DG or | SEL2413E-DG or |
| | 225137DY or | SEL2413E-DY or |
| | 225137CG or | SEL2413E-CG or |
| | 225137CY | SEL2413E-CY |
| | **Holder** | |
| | 27190574 | (LED-4) |

## POWER AMPLIFIER (I) PC BOARD (NAAF-3113-3A) – PARTS LIST

| CIRCUIT NO. | PART NO. | DESCRIPTION |
|---|---|---|
| | **ICs** | |
| Q519, Q520 | 222942 | NJM4558SE |
| | **Transistors** | |
| Q501, Q502 | 2212805 or | 2SK389-GR or |
| | 2212806 or | 2SK389-BL or |
| | 2212807 | 2SK389-V |
| Q503~Q506 | 2211733 or | 2SC1845-E or |
| | 2211732 | 2SC1845-F |
| Q507, Q508 | 2211515 or | 2SA995-F or |
| | 2211516 | 2SA995-G |
| Q511, Q512 | 2211455 or | 2SA1015-GR or |
| | 2210803 | 2SA733-P |
| Q513, Q514 | 2211354 or | 2SA949-Y or |
| | 2211353 | 2SA949-O |
| Q901 | 2201444 or | 2SD1408-Y or |
| | 2201443 | 2SD1408-O |
| Q902 | 2201502 or | 2SB889-Q or |
| | 2201503 | 2SB889-R |
| Q903 | 2211733 or | 2SC1845-E or |
| | 2211732 | 2SC1845-F |
| Q904, Q905 | 2213335 | 2SK373-GR |
| | **Diodes** | |
| D505, D506 | 225232 | LTZ-R15, LED |
| D517~D520 | | |
| D273, D274 | 223145 | 1S2076TD |
| D902, D904 | 224652204 or | HZ22E-B4 or |
| | 224152204 or | 05AZ22R or |
| | 224452204 | MTZ22-D, Zener |
| D903 | 224650623 or | HZ6.2E-B3 or |
| | 224150623 or | 05AZ6.2Z or |
| | 224450623 | MTZ6.2-C, Zener |
| | **Capacitors** | |
| C381~C390 | 373301014 | 100 pF, 125V, Film (PP) |
| C501, C502 | 372126804 | 68 pF, 50V, Styrene |
| C503, C504 | 372121014 | 100 pF, 50V, Styrene |
| C505, C506 | 354780479 | 4.7 μF, 50V, Elect. |
| C511, C512 | 372123304 | 33 pF, 50V, Styrene |
| C513~C516 | 391252207 | 22 μFF, 25V, Elect. (MUSE) |
| C521, C522 | 372123304 | 33 pF, 50V, Styrene |
| C523, C524 | 354762209 | 22 μF, 35V, Elect. |
| C861 | 354741019 | 100 μF, 16V, Elect. |
| C901, C902 | 354772219 | 220 μF, 63V, Elect. |
| C903, C904 | 354751019 | 100 μF, 25V, Elect. |
| C905, C906 | 354751029 | 1000 μF, 25V, Elect. |
| C911, C912 | 354774719 | 470 μF, 63V, Elect. |
| C913 | 354721019 | 100 μF, 6.3V, Elect. |
| C914 | 354722229 | 2200μF, 6.3V, Elect. |
| C917 | 354764709 | 47 μF, 35V, Elect. |
| | **Resistors** | |
| R281~R283 | 442524704 | 47Ω, 1/2W, Metal oxide film |
| R507, R508 | 441623314 | 330Ω, 1W, Metal oxide film |
| R523, R524 | 442520684 | 6.8Ω, 1/2W, Metal oxide film |
| R527, R528 | 442524734 | 47kΩ, 1/2W, Metal oxide film |
| R901, R902 | 441620434 | 4.3Ω, 1W, Metal oxide film |
| R903 | 442523314 | 330Ω, 1/2W, Metal oxide film |
| R904 | 442525114 | 510Ω, 1/2W, Metal oxide film |
| R907 | 442521034 | 10kΩ, 1/2W, Metal oxide film |
| | **Switches** | |
| S351 | 25030219 | NRSM-165-25SS, Rotary |
| S352 | 25030292 | NRSM-145-25SS, Rotary |
| S353 | 25030302 | NRSM-183-25SS, Rotary |
| | **Terminals** | |
| P291 | 25045165 | NPJ-4PDBL59, (TAPE) |
| P292, P293 | 25045165 | NPJ-4PDBL59, (DAT, PRC) |
| P294 | 25045182 | NPJ-2PDBL72, (PREOUT) |
| P295 | 25045166 | NPJ-6PDL60, (VIDEO) |
| | **Socket ass'y** | |
| P211 | 2000560 | NSAS-6P516 |
| P361 | 2000752 | NSAS-14P708 |
| P501 | 2000556 | NSAS-6P512 |
| P503 | 2000750 | NSAS-20P706 |
| | **Jumper socket** | |
| JL912, JL952 | 25050270 | NSCT-6P98 |
| JL953 | | |

## POWER AMPLIFIER (II) PC BOARD (NAAF-3114-3) – PARTS LIST

| CIRCUIT NO. | PART NO. | DESCRIPTION |
|---|---|---|
| | **Transistors** | |
| Q517, Q518 | 2211255 or | 2SC1815-GR or |
| | 2210746 | 2SC945A-P |
| Q601, Q602 | 2211634 or | 2SC2229-Y or |
| | 2211633 | 2SC2229-O |
| Q603, Q604 | 2211354 or | 2SA949-Y or |
| | 2211353 | 2SA949-O |
| Q605, Q606 | 2201644 or | 2SC3298-Y or |
| | 2201643 | 2SC3298-O |
| Q607, Q608 | 2201634 or | 2SA1306-Y or |
| | 2201633 | 2SA1306-O |
| Q615, Q616 | 2212560 | 2SC3333 |
| Q617, Q618 | 2211793 or | 2SA992-E or |
| | 2211792 | 2SA992-F |
| | **Diodes** | |
| D513, D514 | 223163 | 1SS133 |
| D515, D516 | 4000120 | KB-265, Varistor |
| | **Coils** | |
| L601, L602 | 231134 | S-0.8E |
| | **Capacitors** | |
| C509, C510 | 379122235 | 0.022 μF, 50V, Film (DEW) |
| C607, C608 | 379121045 | 0.1 μF, 50V, Film (DEW) |
| C609, C610 | 379124735 | 0.047 μF, 50V, Film (DEW) |
| C613~C616 | 379121045 | 0.1 μF, 50V, Film (DEW) |

| | | |
|---|---|---|
| | **Resistors** | |
| R531, R532 | 5210062 | N06HR4.7KBD, Semi-fixed |
| R601, R602 | 442522224 | 2.2KΩ, 1/2W, Metal oxide film |
| R603, R604 | 442522214 | 220Ω, 1/2W, Metal oxide film |
| R607~R610 | 442520224 | 2.2Ω, 1/2W, Metal oxide film |
| R615~R618 | 4000078 | 0.33Ω, 5W, Metal plate |
| R619, R620 | 441720104 | 1Ω, 2W, Metal oxide film |
| R645, R646 | 441720824 | 8.2Ω, 2W, Metal oxide film |
| | **Jumper socket** | |
| JL906 | 25050268 | NSCT-4P96 |
| | **Plate** | |
| | 27300877 | Bus line |

## VIDEO TERMINAL PC BOARD (NAETC-3116-3) – PARTS LIST

| CIRCUIT NO. | PART NO. | DESCRIPTION |
|---|---|---|
| | **Diodes** | |
| D281~D283 | 223163 | ISS133 |
| | **Terminals** | |
| P281 | 25045225 | NPJ-3PDBL101 |
| P282 | 25045181 | NPJ-2PDBL71 |
| | **Relays** | |
| RL281~RL283 | 25065298 | NRL-1P1A-DC12-40 |

## SPEAKER & PROTECTOR CIRCUIT PC BOARD (NAETC-3117-3A) – PARTS LIST

| CIRCUIT NO. | PART NO. | DESCRIPTION |
|---|---|---|
| | **IC** | |
| Q851 | 222584 | TA7317P |
| | **Diodes** | |
| D852 | 223145 | 1S2076TD |
| D853 | 224650623 or<br>224150623 or<br>224450623 | HZ6.2EB3 or<br>05AZ6.2Z or<br>MTZ6.2C, Zener |
| D854 | 223163 | 1SS133 |
| D931, D961 | 22380013 | RDF02M |
| | **Capacitors** | |
| C681~C684 | 372121024 | 1000 pF, 50V, Styrene |
| C687 | 379122235 | 0.022 μF, 50V, Film (DEW) |
| C851 | 354722219 | 220 μF, 6.3V, Elect. |
| C852 | 354742209 | 22 μF, 16V, Elect. |
| C853 | 354784799 | 0.47 μF, 50V, Elect. |
| C855 | 354743319 | 330 μF, 16V, Elect. |
| C857 | 354744719 | 470 μF, 16V, Elect. |
| C858, C859 | 379122235 | 0.022 μF, 50V, Film (DEW) |
| C961 | 354741029 | 1000 μF, 16V, Elect. |
| | **Resistors** | |
| R861, R961 | 442522294 | 0.22Ω, 1/2W, Metal oxide film |
| R875, R876 | 441623914 | 390Ω, 1W, Metal oxide film |
| | **Terminal** | |
| P851 | 25060124 | NTM-8PDMN057 |
| | **Relay** | |
| RL851 | 25065316 | NRL-2P7A-DC12-43 |
| | **Switch** | |
| S851a | 25065361 | NSS-44137 |
| | **Sockets** | |
| P853 | 2000794 | NSAS-4P750 |
| P854 | 2000795 | NSAS-4P751 |
| | **Jumper socket** | |
| JL853 | 25050280 | NSCT-3P108 |

## MUTING SWITCH CIRCUIT PC BOARD (NASW-3121-3) – PARTS LIST

| CIRCUIT NO. | PART NO. | DESCRIPTION |
|---|---|---|
| | **Capacitors** | |
| C331, C332 | 354782299 | 0.22 μF, 50V, Elect. |
| C333, C334 | 354784799 | 0.47 μF, 50V, Elect. |
| | **Switch** | |
| S331 | 25035573 | NPS-162-L535 |

## FUSE CIRCUIT PC BOARD ( NAETC-3385-3A ) – PARTS LIST

| CIRCUIT NO. | PART NO. | DESCRIPTION |
|---|---|---|
| | **Fuse holder** | |
| F921a | 250113 | S-N5051 [D] [X] |
| F922a | 25050065 | YSH403T [G] [A] [B] [W] [X] |
| | **Terminal** | |
| | 25060092 | NTM-1S33 [G] [A] [B] [W] |

## DIGITAL CIRCUIT PC BOARD (NADC-3386-1) – PARTS LIST

| CIRCUIT NO. | PART NO. | DESCRIPTION |
|---|---|---|
| | **ICs** | |
| Q701 | 24120017 | TORX175 |
| Q702, Q712 | 222755 | TC74HCU04P |
| Q703, Q710 | 222740005 | 74HC00P |
| Q704, Q706 | 22240112 | TC74HC10P |
| Q705 | 22240113 | YM3623B |
| Q707 | 22240176 | YM3414 |
| Q708 | 222740025 | 74HC02P |
| C709 | 222740275 | 74HC27P |
| Q711 | 222740745 | 74HC74P |
| Q801, Q802 | 22240184 | PCM58P |
| Q803, Q804 | 222902 | NJM5532DD |
| Q805, Q806, Q984 | 222570 | NJM4560D-X |
| Q807, Q808 | 22240201 | NJM4565D-B |
| Q951 | 222780055 | 78M05HF |
| Q982 | 22240134 | NJM2904D |
| | **Transistors** | |
| Q713 | 2211255 | 2SC1815-GR |
| Q714, Q811 | 2213300 | DTA124XS |
| Q715, Q809, Q815 | 2213290 | DTC114ES |
| Q813, Q814 | 2212524 | 2SK363-GR |
| Q981 | 226007 | TLP531, Photo coupler |
| Q983 | 2211256 | 2SC1815-BL |
| Q985 | 2211164 or<br>2211163 | 2SC2120-Y or<br>2SC2120-O |
| Q986 | 2211504 or<br>2211503 | 2SA950-Y or<br>2SA950-O |
| | **Diodes** | |
| D701~D709<br>D712, D713<br>D721~D724<br>D791, D801 | 223163 | 1SS133 |
| D720 | 224650511 or<br>224150511 or<br>224450511 | HZ5.1E-B1 or<br>05AZ5.1X<br>MTZ5.1A, Zener |
| D981 | 224650512 or<br>224150512 or<br>224450512 | HZ5.1E-B2 or<br>0.5AZ5.1Y<br>MTZ5.1B, Zener |
| | **Coils** | |
| L701 | 231029 | NCH-1068 |
| L702, L705 | 231054 | NCH-5095, Filter |
| L703 | 233359 | NCH-2163 |

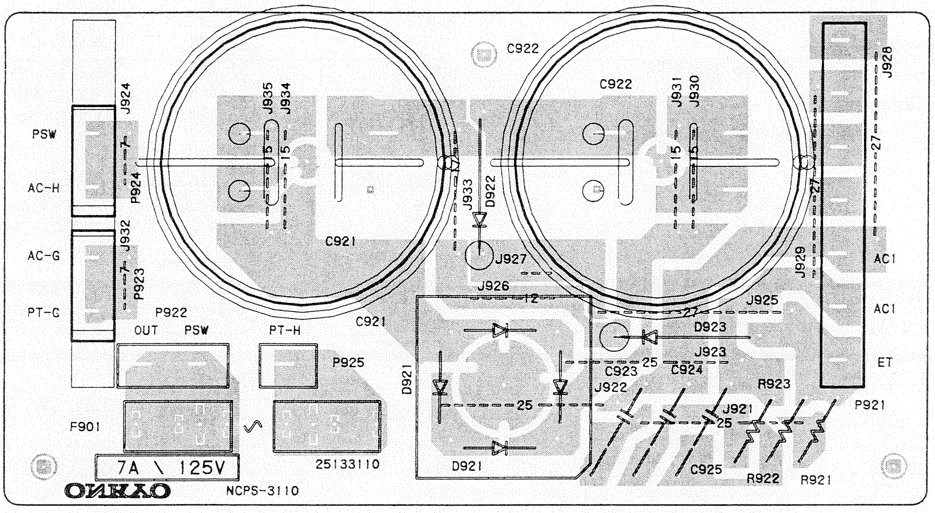
| | | |
|---|---|---|
| L704 | 233360 | NCH-2164 |
| L709~L712 | | |
| L706 | 230905 | BL02RN1-R62, FR core |
| L707 | 230906 | BL02RN2-R62, FR core |
| L713 | 232143 | NSRF2047, RF coil |
| L714 | 231069A or | NCH-1119 or |
| | 231066 | NCH-1118 |
| L715 | 233357 | NCH-2161 |
| | **Osc. element** | |
| X701 | 3010144 | CSA18.00MX040 |
| | **Capacitors** | |
| C701, C710, C711 | 354741009 | 10 μF, 16V, Elect. |
| C719, C720, C723 | | |
| C724, C727, C729 | | |
| C731, C733, C735 | | |
| C737 | | |
| C801~C804 | | |
| C702, C703, C707 | 354781099 | 0.1 μF, 50V, Elect. |
| C713 | 379124724 | 4700 pF, 50V, Film (DEW) |
| C716 | 354780109 | 1 μF, 50V, Elect. |
| C717 | 354782299 | 0.22 μF, 50V, Elect. |
| C718 | 354780229 | 2.2 μF, 50V, Elect. |
| C805~C808 | | |
| C725 | 354724719 | 470 μF, 6.3V, Elect. |
| C809, C810 | 372121514 | 150 pF, 50V, Styrene |
| C811, C812 | 379121134 | 0.011 μF, 50V, Film (DEW) |
| C813, C814, C817 | 379122224 | 2200 pF, 50V, Film (DEW) |
| C818, C821, C822 | | |
| C825, C826 | 372124724 | 4700 pF, 50V, Styrene |
| C831~C834 | 391244707 | 47 μF, 16V, Elect. (MUSE) |
| C835~C842 | 354744709 | 47 μF, 16V, Elect. |
| C843~C846 | 354742219 | 220 μF, 16V, Elect. |
| C847, C848 | 391242207 | 22 μF, 16V, Elect. (MUSE) |
| C979, C980 | 354742229 | 2200 μF, 16V, Elect. |
| C981 | 354722229 | 2200 μF, 6.3V, Elect. |
| C982 | 354780229 | 2.2 μF, 50V, Elect. |
| C983, C995 | 354762209 | 22 μF, 35V, Elect. |
| C984 | 354721019 | 100 μF, 6.3V, Elect. |
| C985 | 354744709 | 47 μF, 16V, Elect. |
| C986 | 354723319 | 330 μF, 16V, Elect. |
| C987, C988 | 379121035 | 0.01 μF, 50V, Film (DEW) |
| C989 | 354723319 | 330 μF, 6.3V, Elect. |
| C990, C993, C997 | 354721019 | 100 μF, 6.3V, Elect. |
| C991, C992 | 354742219 | 220 μF, 16V, Elect. |
| C993 | | |
| | **Resistors** | |
| R809~R816 | 5210070 | N06HR100KBD, Semi-fixed |
| R894 | 442522414 | 240Ω, 1/2W, Metal oxide film |
| R979 | 442521224 | 1.2kΩ, 1/2W, Metal oxide film |
| R981 | 442521114 | 110Ω, 1/2, Metal oxide film |
| | **Relays** | |
| RL701 | 25065345 | NRL-1P1A-DC05-49 |
| RL731 | 25065282 | NRL-2P1.25A-DC12-39 |
| | **Terminals** | |
| P711 | 25045224 | NPJ-2PDOR100 |
| P712 | 25045251 | NPJ-1PDOR123 |
| | **Jumper socket** | |
| JL701 | 25050267 | NSCT-3P-95 |
| | **Plugs** | |
| P731 | 25055133 | NPLG-3P-117 |
| P232a | 25055186 | NPLG-5P-170 |
| P952 | 25055184 | NPLG-3P-168 |
| | **Plate** | |
| | 27160215-1 | Bus line |

## DIGITAL POWER SUPPLY CIRCUIT BOARD (NAPS-3387-1) – PARTS LIST

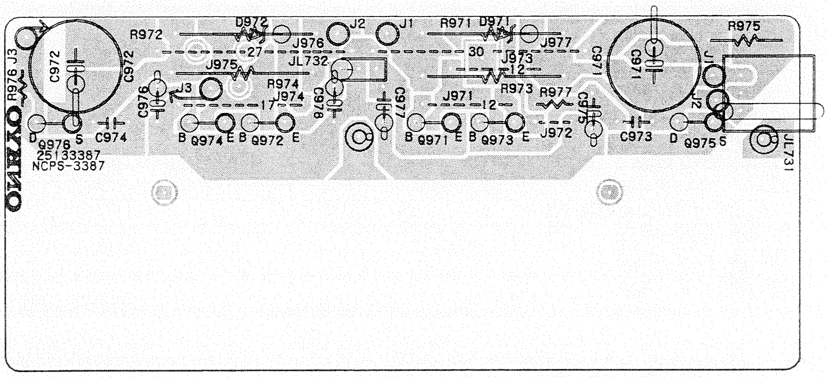
| CIRCUIT NO. | PART NO. | DESCRIPTION |
|---|---|---|
| | **Transistors** | |
| Q971 | 2201444 or | 2SD1408-Y or |
| | 2201443 | 2SD1408-O |
| Q972 | 2201434 or | 2SB1017-Y or |
| | 2201433 | 2SB1017-O |
| Q973 | 2211255 | 2SC1815-GR |
| Q974 | 2211455 | 2SA1015-GR |
| Q975, Q976 | 2213335 | 2SK373-GR |
| | **Diodes** | |
| D971, D972 | 224651602 or | HZ16E-B2 or |
| | 224151602 or | 05AZ16Y or |
| | 224451602 | MTZ16B, Zener |
| | **Capacitors** | |
| C971, C972 | 354774719 | 470 μF, 63V, Elect. |
| C975, C976 | 354751019 | 100 μF, 25V, Elect. |
| C977, C978 | 354744709 | 47 μF, 16V, Elect. |
| | **Resistors** | |
| R971~R974 | 441724314 | 430Ω, 2W, Metal oxide film |
| | **Jumper socket** | |
| JL731 | 25050280 | NSCT-3P108 |

# PRINTED CIRCUIT BOARD VIEW FROM BOTTOM SIDE

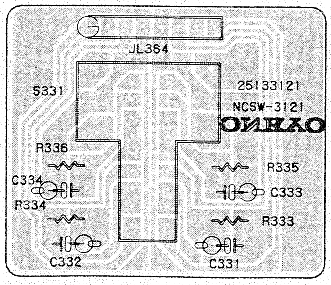
## NAPS-3110-3


C922
C922
J924
J935
J934
J931
J930
J928
PSW
AC-H
AC-G
PT-C
P924
J932
P923
J933
D922
C921
J927
J926
J925
J929
AC1
AC1
ET
P922
OUT
PSW
PT-H
C921
P925
D921
D923
J923
C923
C924
J922
R923
J921
P921
F901
7A \ 125V
25133110
D921
C925
R922
R921
ONKYO
NCPS-3110
15
15
15
15
7
7
27
27
27
12
25
25
25

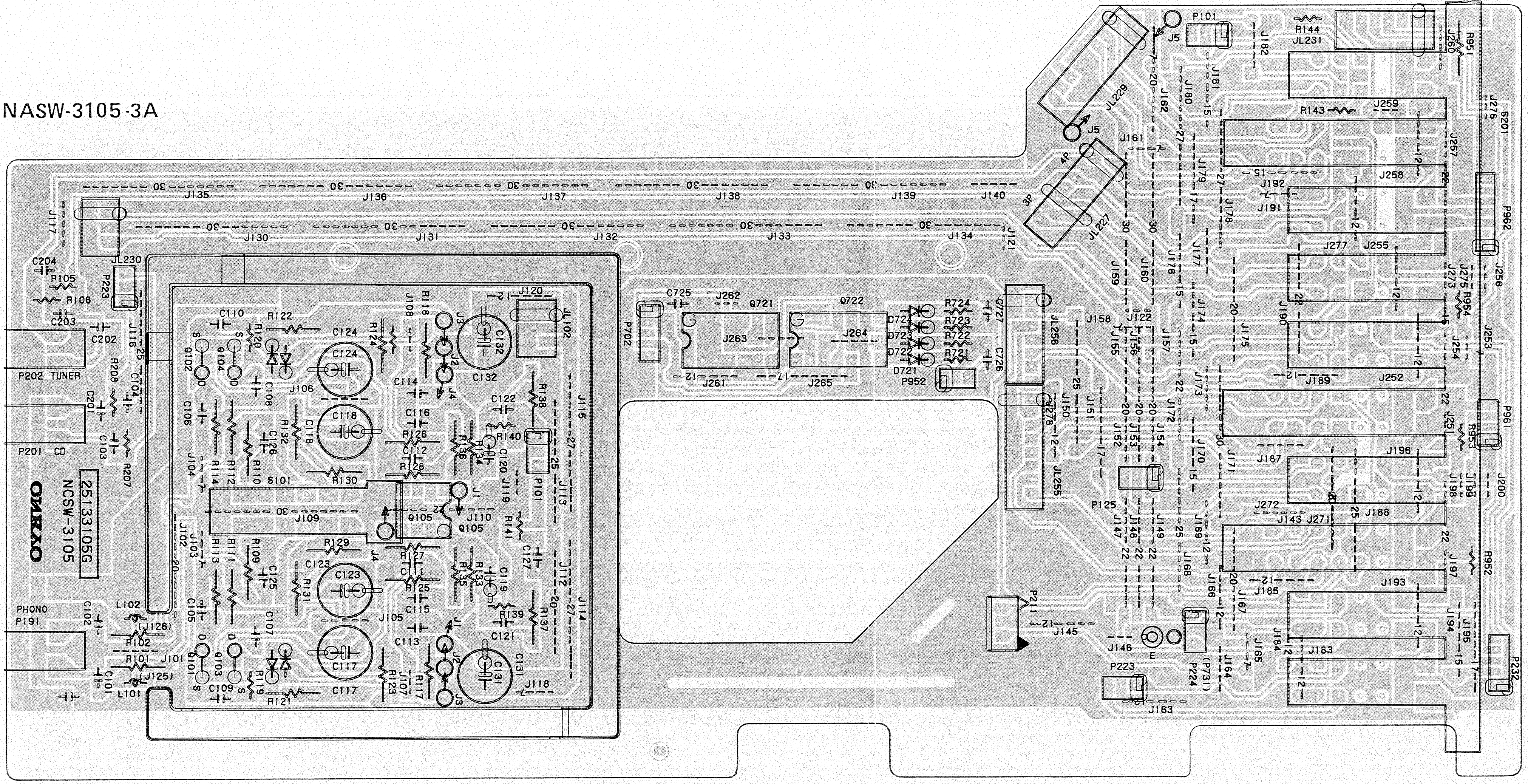
## NADIS-3387-1


J3
R976
C972
R972
C972
D972
J2
J1
R971
D971
R975
J976
J975
JL732
J977
C971
C971
J3
R974
J974
C978
C976
C977
J973
R973
R977
J971
C975
J972
C974
C973
Q976
Q974
Q972
Q971
Q973
Q975
JL731
D
S
B
E
B
E
B
E
B
E
D
S
27
17
30
12
12
25133387
NCPS-3387
ONKYO

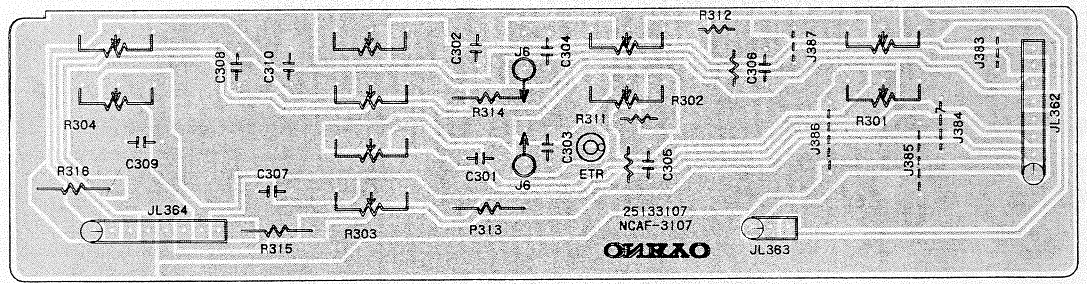
## NASW-3121-3


JL364
S331
25133121
NCSW-3121
ONKYO
R336
R335
C334
C333
R334
R333
C332
C331

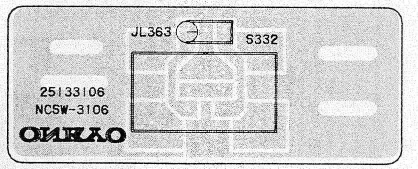
## NASW-3105-3A


25133105G
NCSW-3105
ONKYO
P202 TUNER
P201 CD
PHONO
P191
J135
J136
J137
J138
J139
J140
J130
J131
J132
J133
J134
P101
R144
JL231
R143
J259
J258
J255
J252
J5
JL229
JL227
D721
P952
J262
J263
J264
J261
J265
Q721
Q722
C725
P702
J145
J146
P223
P224
J183
J185
J193
J188
J198
P961
P962
P232
S201
R951
R952
R953
R954

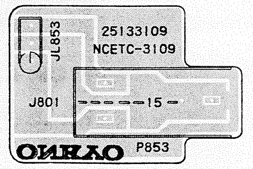
## NAAF-3107-3


25133107
NCAF-3107
ONKYO
R312
C308
C310
C302
C304
C306
J387
J383
JL362
R304
R314
R311
R302
R301
C309
C301
C303
C305
ETR
J386
J385
J384
R316
C307
JL364
R303
P313
P315
JL363

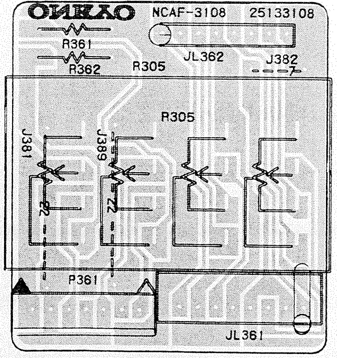
## NASW-3106-3


JL363
S332
25133106
NCSW-3106
ONKYO

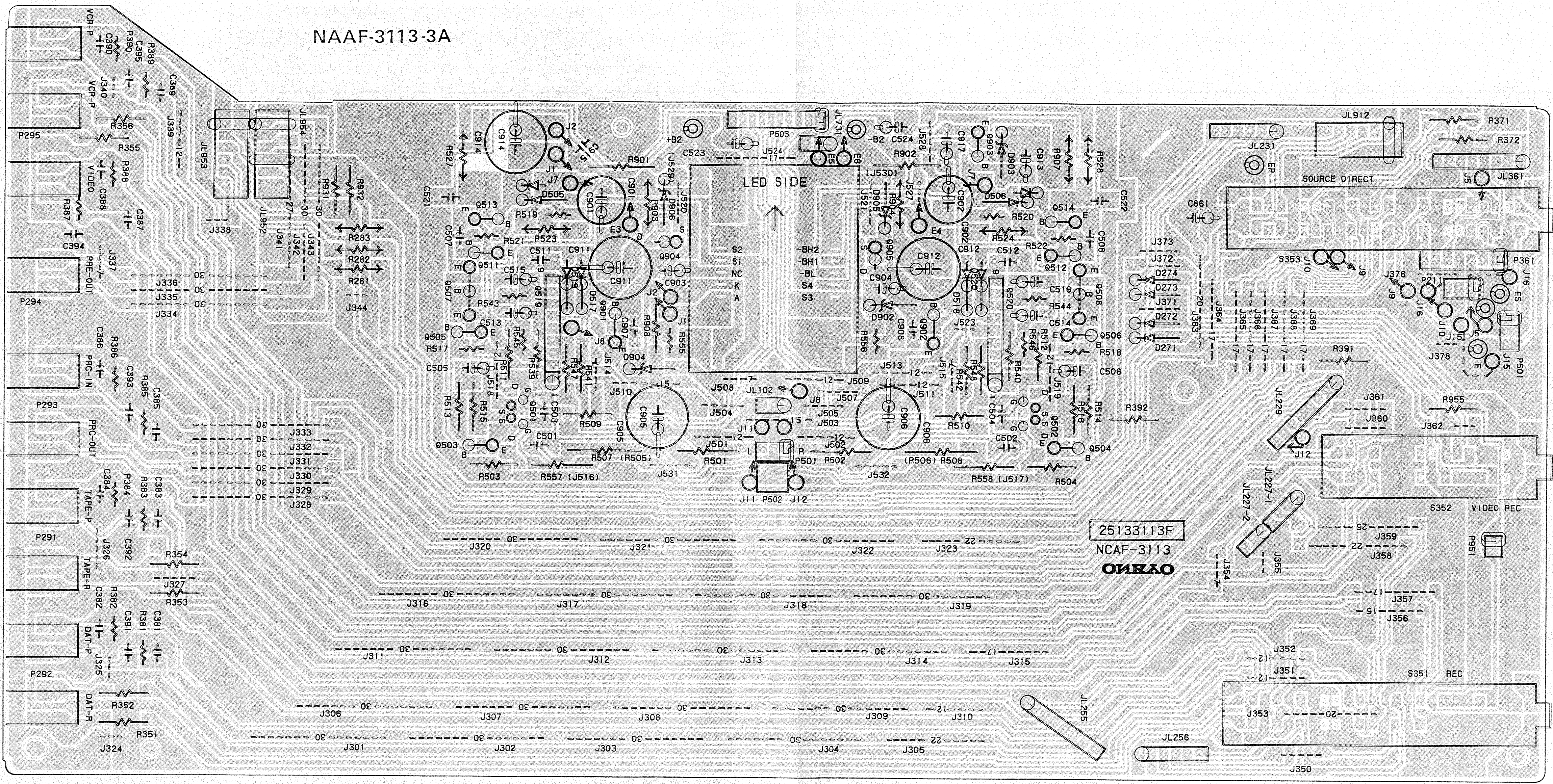
## NAETC-3109-3


JL853
25133109
NCETC-3109
J801
15
ONKYO
P853

## NAAF-3108-3

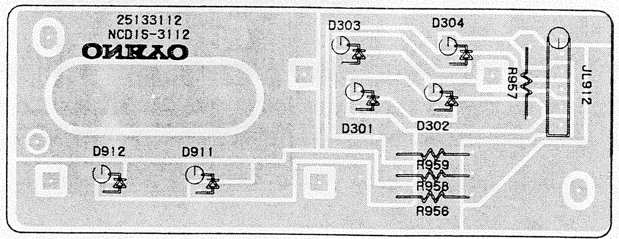

ONKYO
NCAF-3108
25133108
R361
R362
R305
JL362
J382
J381
J389
P361
JL361

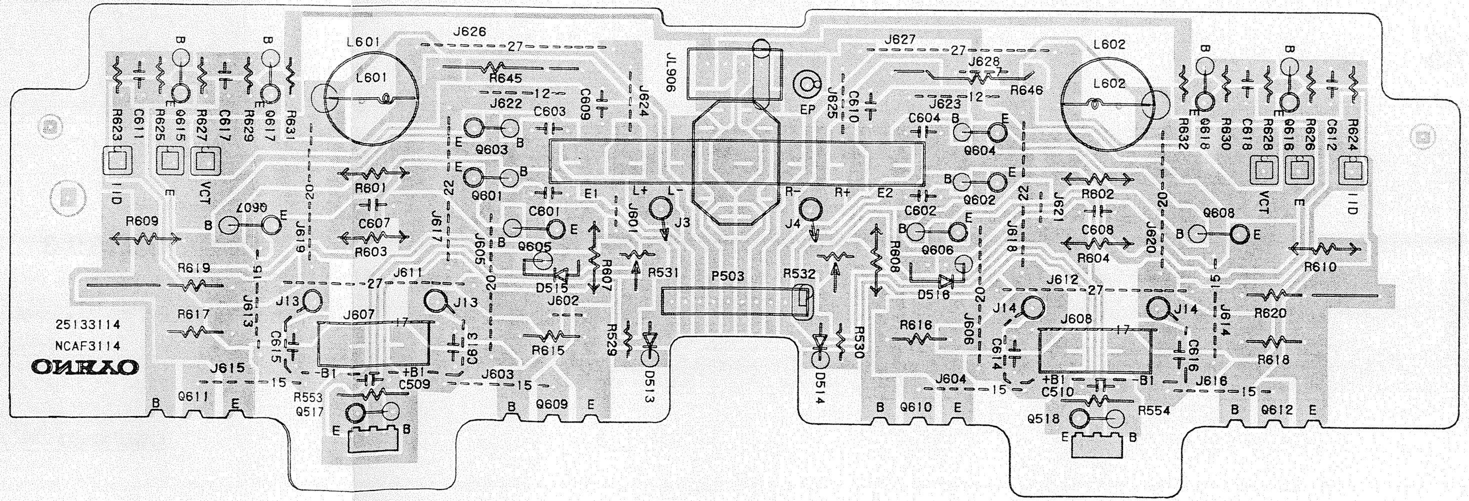
NAAF-3113-3A


LED SIDE
SOURCE DIRECT
VIDEO REC
REC
25133113F
NCAF-3113
ONKYO
VCR-P
VCR-R
VIDEO
PRE-OUT
PRC-IN
PRC-OUT
TAPE-P
TAPE-R
DAT-P
DAT-R
P295
P294
P293
P291
P292
P503
P502
P501
P361
JL912
JL231
JL361
JL953
JL954
JL952
JL102
JL229
JL227-1
JL227-2
JL255
JL256
S353
S352
S351
C914
C913
C911
C912
C905
C906
R901
R902
R371
R372
J301
J302
J303
J304
J305
J306
J307
J308
J309
J310
J311
J312
J313
J314
J315
J316
J317
J318
J319
J320
J321
J322
J323
J350
J353

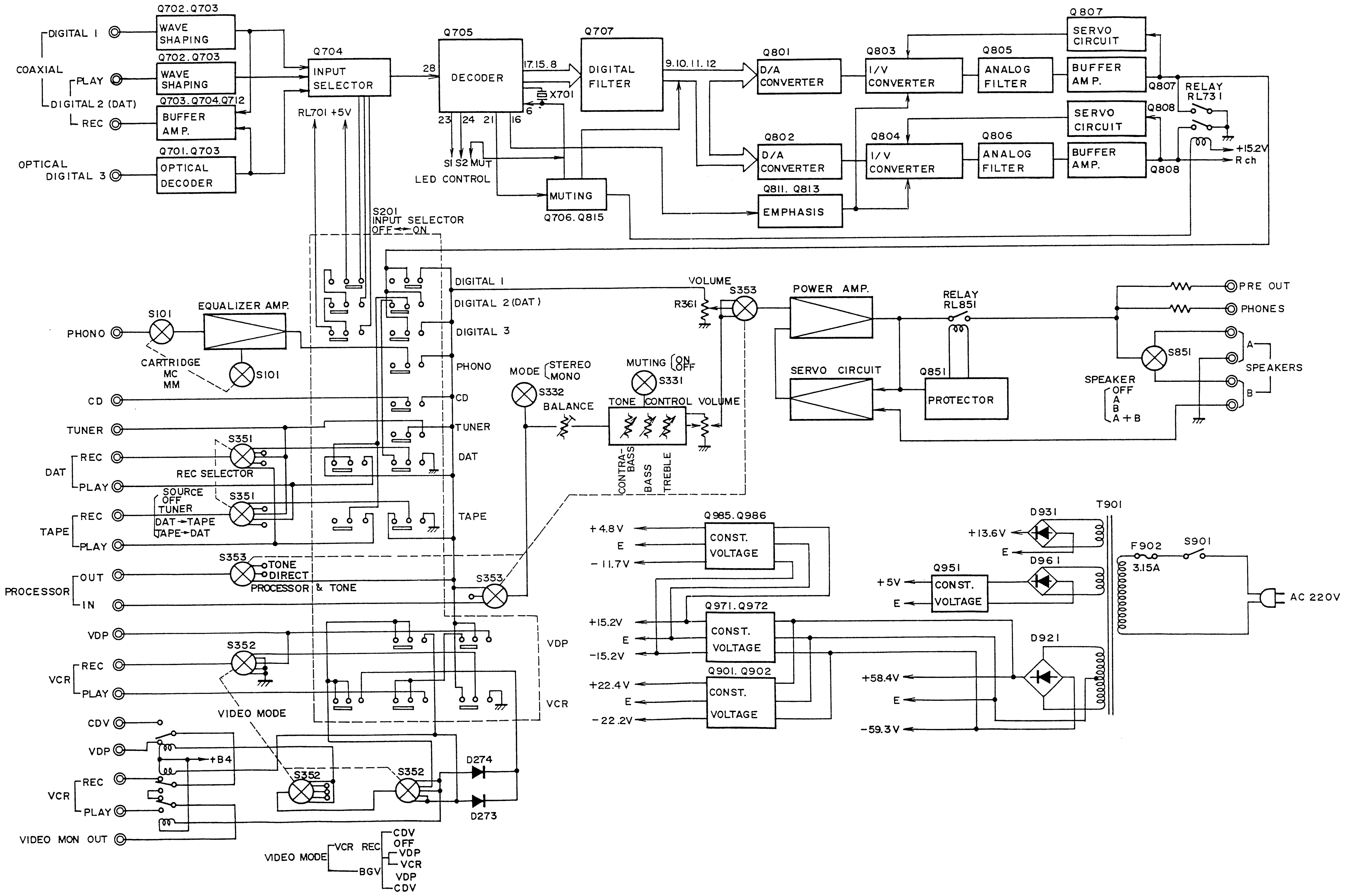
NAAF-3114-3

NADIS-3112-3

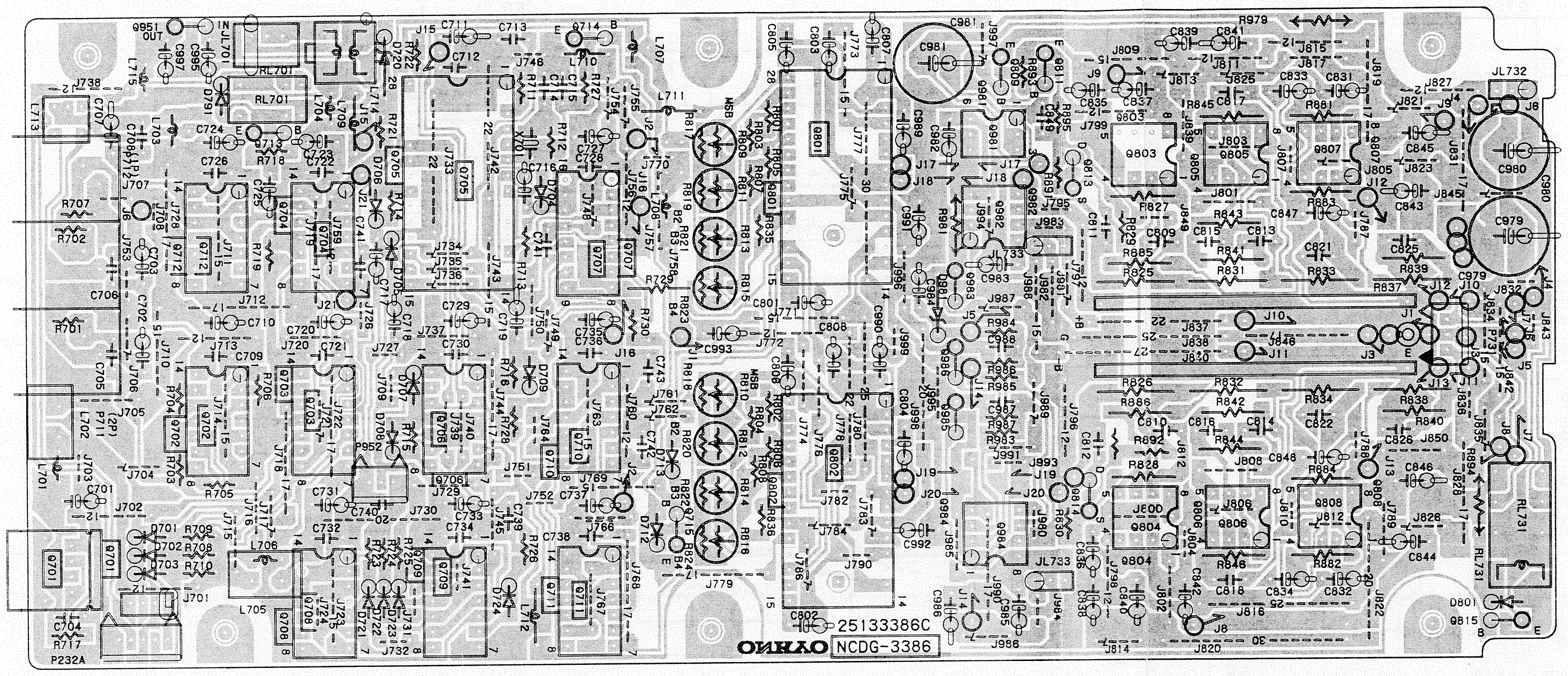

25133112
NCDIS-3112
ONKYO
D303
D304
D301
D302
D912
D911
R957
R959
R958
R956
JL912


L601
L602
J626
J627
JL906
EP
P503
J3
J4
Q601
Q602
Q603
Q604
Q605
Q606
Q607
Q608
Q609
Q610
Q611
Q612
Q517
Q518
R553
R554
C509
C510
J607
J608
J13
J14
D513
D514
D515
D516
R531
R532
25133114
NCAF3114
ONKYO

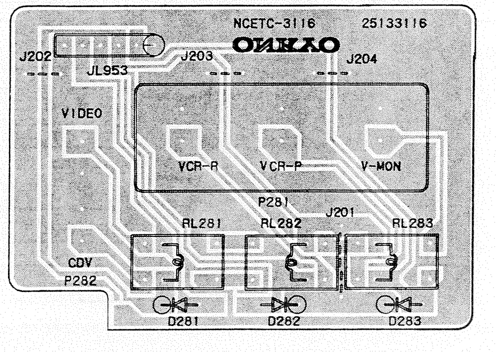
# BLOCK DIAGRAM


DIGITAL 1
COAXIAL
PLAY
DIGITAL 2 (DAT)
REC
OPTICAL DIGITAL 3
Q702.Q703
WAVE SHAPING
Q702.Q703
WAVE SHAPING
Q703.Q704.Q712
BUFFER AMP.
Q701.Q703
OPTICAL DECODER
Q704
INPUT SELECTOR
RL701 +5V
Q705
DECODER
28
17.15.8
X701
6
23 24 21 16
S1 S2 MUT
LED CONTROL
Q707
DIGITAL FILTER
9.10.11.12
MUTING
Q706.Q815
Q801
D/A CONVERTER
Q802
D/A CONVERTER
Q811. Q813
EMPHASIS
Q803
I/V CONVERTER
Q804
I/V CONVERTER
Q805
ANALOG FILTER
Q806
ANALOG FILTER
Q807
SERVO CIRCUIT
BUFFER AMP.
Q807
Q808
SERVO CIRCUIT
BUFFER AMP.
Q808
RELAY RL731
+15.2V
R ch
S201
INPUT SELECTOR
OFF ←→ ON
DIGITAL 1
DIGITAL 2 (DAT)
DIGITAL 3
PHONO
CD
TUNER
DAT
TAPE
PHONO
S101
EQUALIZER AMP.
CARTRIDGE
MC
MM
S101
CD
TUNER
S351
DAT REC
PLAY
REC SELECTOR
SOURCE
OFF
TUNER
DAT → TAPE
TAPE → DAT
S351
TAPE REC
PLAY
S353
TONE
DIRECT
PROCESSOR & TONE
PROCESSOR OUT
IN
S353
VDP
VCR REC
PLAY
S352
VIDEO MODE
VDP
VCR
CDV
VDP
+B4
VCR REC
PLAY
VIDEO MON OUT
S352
S352
D274
D273
VIDEO MODE
VCR REC
BGV
CDV
OFF
VDP
VCR
VDP
CDV
MODE
STEREO
MONO
S332
BALANCE
MUTING
ON
OFF
S331
TONE CONTROL
VOLUME
CONTRA-BASS
BASS
TREBLE
VOLUME
R361
S353
POWER AMP.
SERVO CIRCUIT
RELAY RL851
Q851
PROTECTOR
PRE OUT
PHONES
S851
SPEAKERS
A
B
SPEAKER
OFF
A
B
A + B
+4.8V
E
-11.7V
Q985.Q986
CONST. VOLTAGE
+15.2V
E
-15.2V
Q971.Q972
CONST. VOLTAGE
+22.4V
E
-22.2V
Q901.Q902
CONST. VOLTAGE
D931
+13.6V
E
D961
Q951
+5V
E
CONST. VOLTAGE
D921
+58.4V
E
-59.3V
T901
F902
3.15A
S901
AC 220V

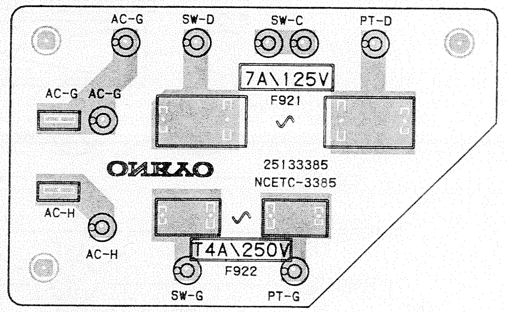
NADG-3386-1


ONKYO
NCDG-3386
25133386C
RL701
RL731
C979
C980
C981
Q801
Q802
Q803
Q804
Q805
Q806
Q807
Q808
Q815
D801
JL732
JL733
P232A
J701
J779
J790
J814
J820
J986

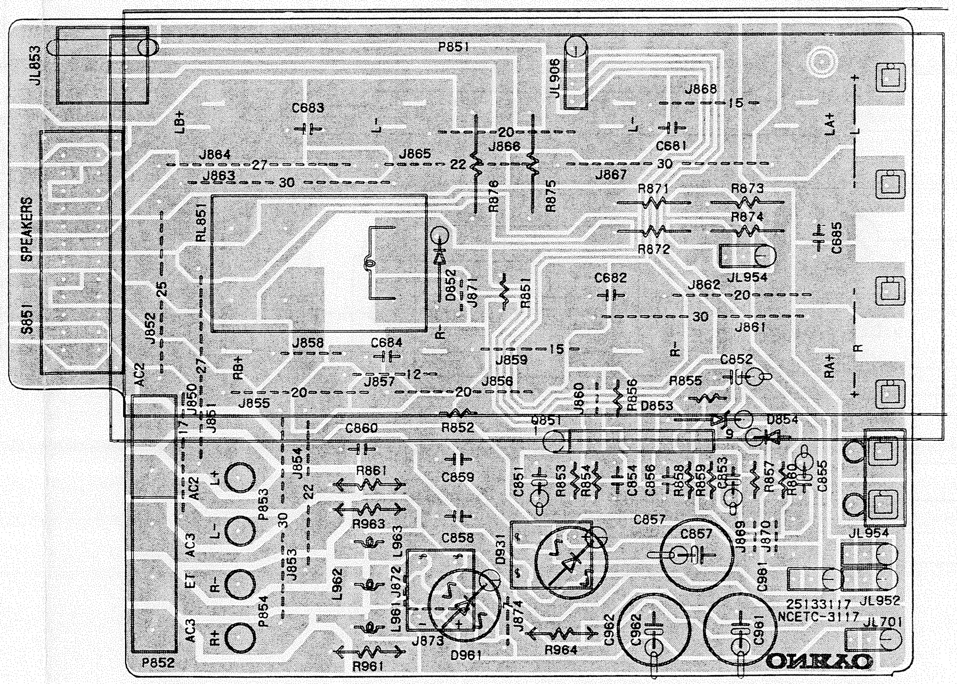
NAETC-3116-3


NCETC-3116
25133116
ONKYO
J202
J203
J204
JL953
VIDEO
VCR-R
VCR-P
V-MON
P281
J201
RL281
RL282
RL283
CDV
P282
D281
D282
D283

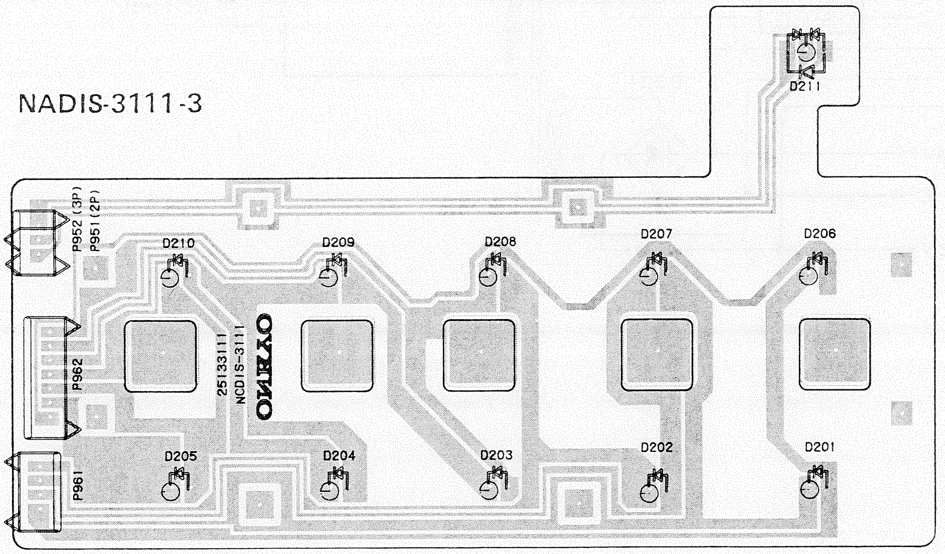
NAETC-3385-3A


AC-G
SW-D
SW-C
PT-D
AC-G
AC-G
7A\125V
F921
ONKYO
25133385
NCETC-3385
AC-H
AC-H
T4A\250V
F922
SW-G
PT-G

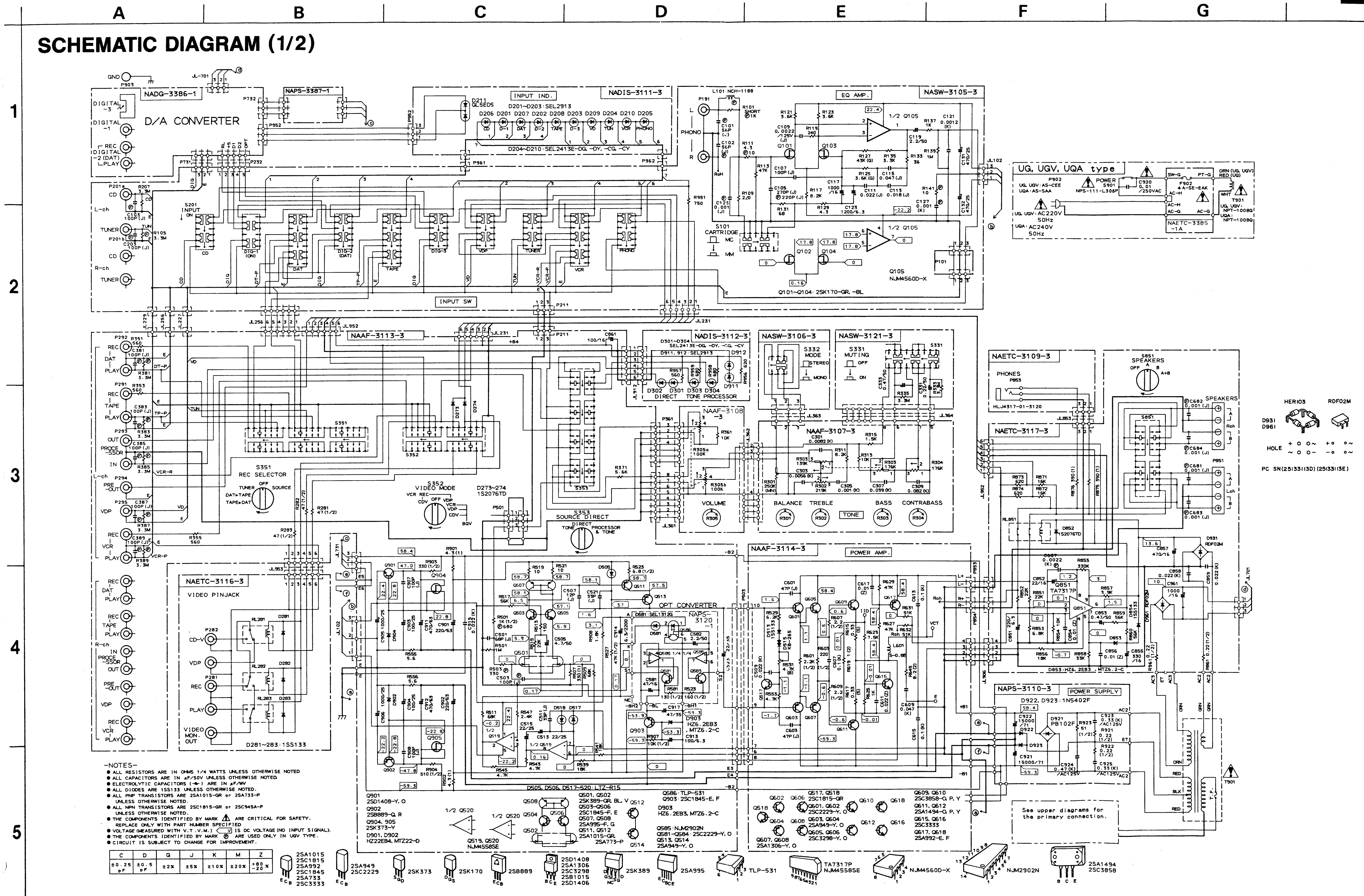
NAAF-3117-3A


JL853
P851
JL906
J866
LB+
C883
J864
J865
J868
C881
J863
J867
R871
R873
R876
R875
R874
LA+
RL851
R872
C885
SPEAKERS
D852
R851
C882
J862
JL954
S851
J852
J871
J861
C884
J858
J859
C852
AC2
RB+
J855
J857
J856
J860
R855
RA+
J850
J851
R852
Q851
R856
D853
D854
C860
C859
C851
R853
C857
R861
R963
L962
C858
D931
R857
R860
C855
JL954
AC3
P853
J854
J853
J872
J873
D961
C962
C961
J874
R964
R961
JL952
25133117
NCETC-3117
JL701
P852
P854
ONKYO

NADIS-3111-3


D211
P952 (3P)
P951 (2P)
D210
D209
D208
D207
D206
ONKYO
25133111
NCDIS-3111
P962
D205
D204
D203
D202
D201
P961

# SCHEMATIC DIAGRAM (1/2)


A
B
C
D
E
F
G
1
2
3
4
5
NADG-3386-1
D/A CONVERTER
NAPS-3387-1
INPUT IND.
NADIS-3111-3
D211 GL5ED5
D201~D203 : SEL2913
D204~D210 : SEL2413E-DG, -DY, -CG, -CY
EQ AMP.
NASW-3105-3
PHONO
S101 CARTRIDGE
MC
MM
Q105 NJM4560D-X
Q101~Q104 : 2SK170-GR, -BL
UG, UGV, UQA type
POWER S901
NPS-111-L30SP
NAETC-3385-1A
S201 INPUT
INPUT SW
CD
DIG-1 (ON)
DAT
DIG-2 (DAT)
TAPE
DIG-3
VDP
TUNER
VCR
PHONO
NAAF-3113-3
NADIS-3112-3
D301~D304 SEL2413E-DG, -DY, -CG, -CY
D911, 912 : SEL2913
DIRECT
TONE PROCESSOR
NASW-3106-3
S332 MODE
STEREO
MONO
NASW-3121-3
S331 MUTING
OFF
ON
NAETC-3109-3
PHONES
S851 SPEAKERS
OFF
A
B
A+B
SPEAKERS
NAETC-3117-3
NAAF-3108-3
NAAF-3107-3
VOLUME
BALANCE
TREBLE
TONE
BASS
CONTRABASS
S351 REC SELECTOR
OFF
TUNER
DAT→TAPE
TAPE→DAT
SOURCE
S352 VIDEO MODE
D273~274 1S2076TD
S353 SOURCE DIRECT
NAETC-3116-3
VIDEO PINJACK
D281~283 : 1SS133
VIDEO MON. OUT
OPT CONVERTER
NAPS-3120-1
NAAF-3114-3
POWER AMP.
Q851 TA7317P
D853 : HZ6.2EB3, MTZ6.2-C
NAPS-3110-3
POWER SUPPLY
D922, D923 : 1N5402F
D921 PB102F
T901
HER103
RDF02M
D931
D961
HOLE
PC SN(25133113D) (25133113E)
D505, D506, D517~520 : LTZ-R15
Q901
2SD1408-Y, O
Q902
2SB889-Q, R
Q904, 905
2SK373-Y
D901, D902
HZ22EB4, MTZ22-D
Q519, Q520
NJM4558SE
Q501, Q502
2SK389-GR, BL, V
Q503~Q506
2SC1845-F, E
Q507, Q508
2SA995-F, G
Q511, Q512
2SA1015-GR,
2SA773-P
Q586 : TLP-531
Q903 : 2SC1845-E, F
D903
HZ6.2EB3, MTZ6.2-C
Q585 : NJM2902N
Q581~Q584 : 2SC2229-Y, O
Q513, Q514
2SA949-Y, O
Q517, Q518
2SC1815-GR
Q601, Q602
2SC2229-Y, O
Q603, Q604
2SA949-Y, O
Q605, Q606
2SC3298-Y, O
Q607, Q608
2SA1306-Y, O
Q609, Q610
2SC3858-O, P, Y
Q611, Q612
2SA1494-O, P, Y
Q615, Q616
2SC3333
Q617, Q618
2SA992-E, F
See upper diagrams for the primary connection.
2SA1015
2SC1815
2SA992
2SC1845
2SA733
2SC3333
2SA949
2SC2229
2SK373
2SK170
2SB889
2SD1408
2SA1306
2SC3298
2SB1015
2SD1406
2SK389
2SA995
TLP-531
TA7317P
NJM4558SE
NJM4560D-X
NJM2902N
2SA1494
2SC3858

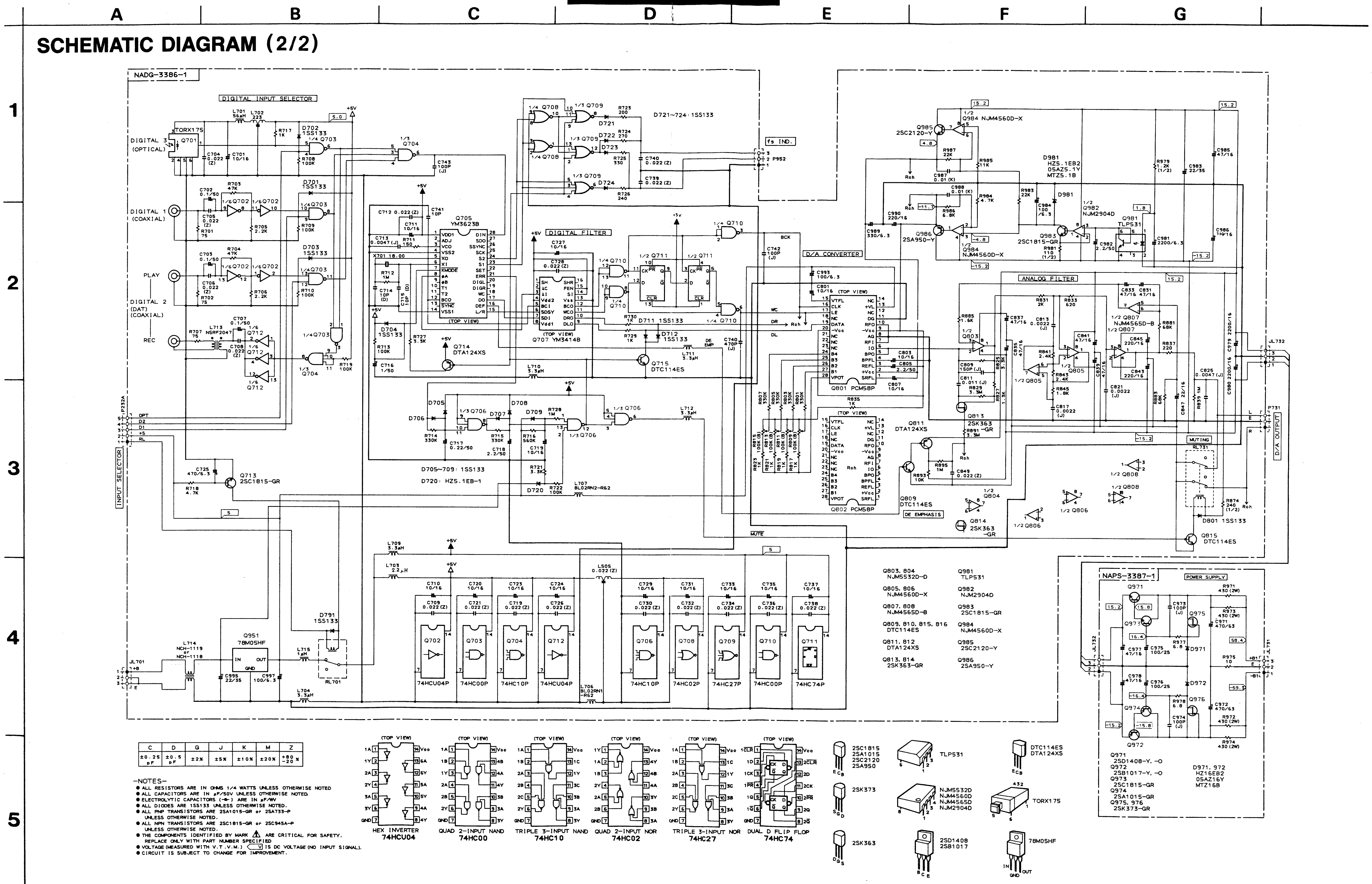
-NOTES-

- ALL RESISTORS ARE IN OHMS 1/4 WATTS UNLESS OTHERWISE NOTED
- ALL CAPACITORS ARE IN µF/50V UNLESS OTHERWISE NOTED.
- ELECTROLYTIC CAPACITORS (⊣⊢) ARE IN µF/WV
- ALL DIODES ARE 1SS133 UNLESS OTHERWISE NOTED.
- ALL PNP TRANSISTORS ARE 2SA1015-GR or 2SA733-P UNLESS OTHERWISE NOTED.
- ALL NPN TRANSISTORS ARE 2SC1815-GR or 2SC945A-P UNLESS OTHERWISE NOTED.
- THE COMPONENTS IDENTIFIED BY MARK ⚠ ARE CRITICAL FOR SAFETY. REPLACE ONLY WITH PART NUMBER SPECIFIED
- VOLTAGE (MEASURED WITH V.T.V.M.) ⊂ V⊃ IS DC VOLTAGE (NO INPUT SIGNAL).
- THE COMPONENTS IDENTIFIED BY MARK Ⓕ ARE USED ONLY IN UGV TYPE.
- CIRCUIT IS SUBJECT TO CHANGE FOR IMPROVEMENT.

| C | D | G | J | K | M | Z |
|---|---|---|---|---|---|---|
| ±0.25 pF | ±0.5 pF | ±2% | ±5% | ±10% | ±20% | +80 -20 % |

**ONKYO CORPORATION**

# SCHEMATIC DIAGRAM (2/2)


A
B
C
D
E
F
G
1
2
3
4
5
NADG-3386-1
DIGITAL INPUT SELECTOR
DIGITAL 3 (OPTICAL)
DIGITAL 1 (COAXIAL)
PLAY
DIGITAL 2 (DAT) (COAXIAL)
REC
INPUT SELECTOR
Q705 YM3623B
DIGITAL FILTER
Q707 YM3414B
fs IND.
D721~724: 1SS133
D/A CONVERTER
Q801 PCM58P
Q802 PCM58P
DE EMPHASIS
ANALOG FILTER
MUTING
D/A OUTPUT
D705~709: 1SS133
D720: HZ5.1EB-1
MUTE
Q951 78M05HF
Q803, 804 NJM5532D-D
Q805, 806 NJM4560D-X
Q807, 808 NJM4565D-B
Q809, 810, 815, 816 DTC114ES
Q811, 812 DTA124XS
Q813, 814 2SK363-GR
Q981 TLP531
Q982 NJM2904D
Q983 2SC1815-GR
Q984 NJM4560D-X
Q985 2SC2120-Y
Q986 2SA950-Y
NAPS-3387-1
POWER SUPPLY
Q971 2SD1408-Y, -O
Q972 2SB1017-Y, -O
Q973 2SC1815-GR
Q974 2SA1015-GR
Q975, 976 2SK373-GR
D971, 972 HZ16EB2 05AZ16Y MTZ16B
HEX INVERTER 74HCU04
QUAD 2-INPUT NAND 74HC00
TRIPLE 3-INPUT NAND 74HC10
QUAD 2-INPUT NOR 74HC02
TRIPLE 3-INPUT NOR 74HC27
DUAL D FLIP FLOP 74HC74
2SC1815 2SA1015 2SC2120 2SA950
2SK373
2SK363
TLP531
NJM5532D NJM4560D NJM4565D NJM2904D
2SD1408 2SB1017
DTC114ES DTA124XS
TORX175
78M05HF

| C | D | G | J | K | M | Z |
|---|---|---|---|---|---|---|
| ±0.25 pF | ±0.5 pF | ±2% | ±5% | ±10% | ±20% | +80 -20 % |

-NOTES-

- ALL RESISTORS ARE IN OHMS 1/4 WATTS UNLESS OTHERWISE NOTED
- ALL CAPACITORS ARE IN μF/50V UNLESS OTHERWISE NOTED.
- ELECTROLYTIC CAPACITORS (-⊪-) ARE IN μF/WV
- ALL DIODES ARE 1SS133 UNLESS OTHERWISE NOTED.
- ALL PNP TRANSISTORS ARE 2SA1015-GR or 2SA733-P UNLESS OTHERWISE NOTED.
- ALL NPN TRANSISTORS ARE 2SC1815-GR or 2SC945A-P UNLESS OTHERWISE NOTED.
- THE COMPONENTS IDENTIFIED BY MARK ⚠ ARE CRITICAL FOR SAFETY. REPLACE ONLY WITH PART NUMBER SPECIFIED
- VOLTAGE (MEASURED WITH V.T.V.M.) ⟨ V⟩ IS DC VOLTAGE (NO INPUT SIGNAL).
- CIRCUIT IS SUBJECT TO CHANGE FOR IMPROVEMENT.

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